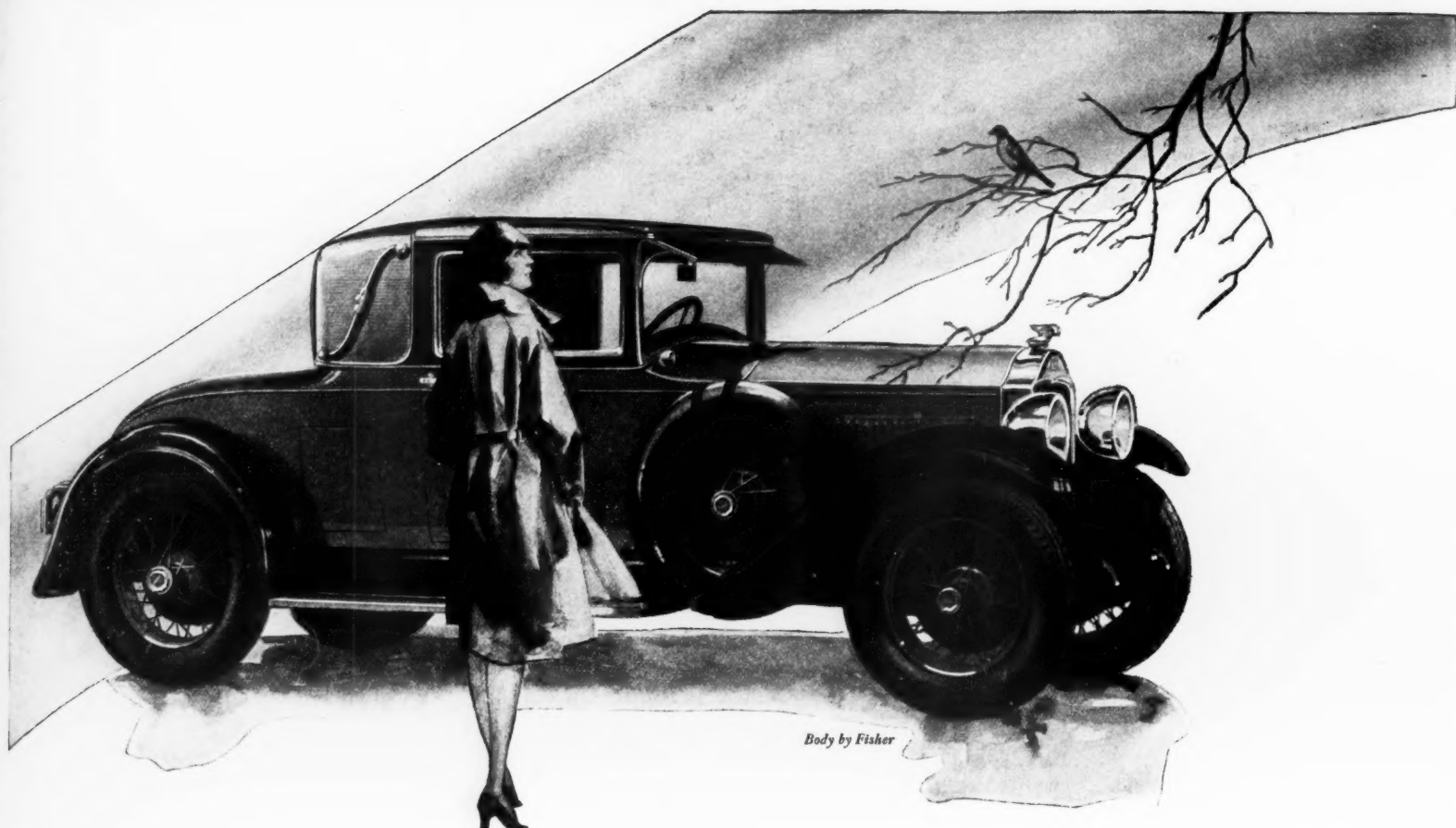


AMERICAN FRUIT GROWER MAGAZINE



March, 1928
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AMERICAN FRUIT GROWER MAGAZINE

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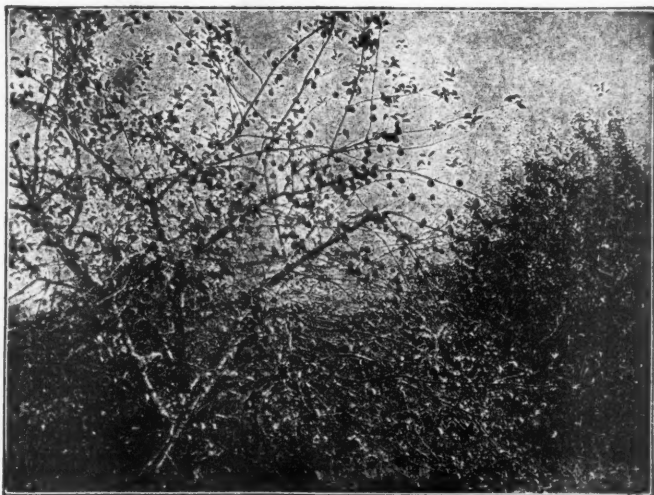
VOLUME XLVIII.

MARCH, 1928

NUMBER 3

The European Red Mite Travels Westward

An apple tree in late summer which has lost much of its foliage from the attacks of the European Red Mite (Courtesy Conn. Exp. Sta.)



WHY DID so many orchards lose their healthy green color in mid-summer, turn brown, and in many cases drop their leaves prematurely? Many attributed this to drought, some to disease, and others to improper feeding of the trees. While any one or all of these reasons may have had something to do with it in some cases, a careful examination of the leaves would undoubtedly have disclosed an infestation of the European red mite, a comparatively new pest, affecting the apple, peach, pear, cherry, plum and prune. In the New England states it is considered one of the major pests, and it has also become well established in New York, New Jersey and Pennsylvania.

The Westward Migration

The spread of this orchard pest in the state of Ohio can safely be assumed to have begun during the past three years. A light infestation is apt to pass unnoticed, but the mite multiplies with amazing rapidity and by the time it has multiplied to the point where its injury to the foliage can be observed, it has become fairly well established in the district. A survey during the latter part of 1927 shows European red mite to be well established from the entire northern tier of Ohio counties south to the center of the state. The peach growers of the Port Clinton district, especially of Catawba Island, have suffered much from foliage injury in their orchards.

The pest appears to have invaded Michigan from the southeast, as the nature and character of the injury to be observed on apple foliage on the eastern side of the state is more pronounced than along the east shore of Lake Michigan. The area of greatest foliage damage appears to be north of Detroit, in the neighborhood of Birmingham, Rochester and Novi. From there it may be observed in orchards westward across the state to Berrien county but is apparently not so well established as yet. Many observers have reported the peculiar "bronzing" and browning of the foliage along the entire east shore of Lake Michigan. But one must there hunt over a tree to find the eggs, while in more eastern sections they have been so numerous as in some cases to give a rusty appearance to the smaller branches.

How much further west this pest has already traveled is difficult to say, owing to the fact, as previously brought out, that it does not intrude its presence on the observation until fairly well established.

Nature of Injury

The European red mite does not destroy or disfigure the fruit. For

This Imported Orchard Pest appears to be Migrating steadily Westward, Infesting Fruit Counties of Ohio and Michigan. Its Economic Importance should not be Underestimated, and Prompt Action should be taken in all infested Fruit Sections.

By Theodore J Haack

this reason, perhaps, it has not been detected long before this. Not until some time after it has been introduced and has had time to multiply does it cause any appreciable damage. This is directly proportionate to the number of mites. It is not unusual

summer, however, when the rapid tree growth has stopped, and the usual summer drought has set in, the mites, which have been multiplying rapidly through several generations consume more plant juices than the tree supplies. As a result the leaves lose



Left: European Red Mite eggs on calyx end of apples; right: eggs on twig; both enlarged three times. In the circle: Eggs from the twig enlarged about 10 times (Courtesy Conn. Exp. Sta.)

to find anywhere from 10 to over a hundred mites per leaf. With that many parasites sucking the sap from the foliage, it is little wonder that discoloration takes place. Early in the season while the tree is making a rapid growth, sap is supplied much quicker than the mites consume it. The loss, therefore, is not noticeable, and no injury is apparent. By mid-

their bright green color, turn brown and in severe cases, many dry up and fall off. Naturally, leaves in this condition cannot function properly; and since there still is much work for them to do, a part of the work remains undone. What about the fruit which depends upon the leaves to elaborate the plant juices and pump them to it? With the reduced supply

of food, the fruit cannot attain its full size. If each apple were reduced but one-eighth of an inch in diameter in this way, how many bushels would be lost per acre?

Influence on Size and Color of Fruit

The nymphs from the eggs laid by a single female red mite in its two weeks of life are sufficient to brown a leaf and to cripple its functions, elaborate the plant juices and pump them. When we consider the importance of the foliage in developing the fruit, it can easily be seen how the European red mite, if well established in a tree, can lessen the size of the fruit to a degree that will throw a portion of the crop out of the marketable range. Thus the grower loses not only by the smaller quantity of the fruit but by the fact that much of this fruit must be classed and sold as culls.

The presence of but a relatively small number of adult mites in a tree will seriously interfere with the coloring of the fruit, and in the prevailing keenly competitive marketing conditions, under color is almost as serious as under size.

It is particularly on the apple that the European red mite has an injurious effect on fruit coloration. On the pear, peach, plum and prune the injury is chiefly noticed on the fruit itself, in lack of size.

Influence on Subsequent Crops

Next year's crop depends upon the fruit buds formed this summer. These, too, depend upon the leaves for their growth and development. Lacking their normal supply of food, their vitality is reduced, which may be reflected in the bloom and set the following spring. Thus a heavy infestation of European red mite affects two crops. The injury to foliage and fruit in an infested orchard may seem negligible until contrasted to an uninfested orchard.

Life History

The European red mite overwinters on the trees as a tiny round red egg laid, generally, on the under side of twigs, in wrinkles of the bark and in bud scars. The eggs can easily be seen with the naked eye, but since

they are very small, and are often partly hidden in cracks and crevices, it requires careful search to find them, unless the infestation is very heavy, in which case even the larger branches are occasionally so heavily coated with eggs that they take on a reddish cast which can be seen from a distance of several feet. About the time the blossom buds begin to show pink, the eggs hatch. The young mites, which are greenish brown in color, crawl to the foliage and begin feeding. Early in the season they seem to feed mostly on the under side of the leaves, but later generations are found on all portions of the foliage. After moulting several times during a period of about two weeks, they are fully matured. The adult female is dark red, while the male is brown. The mites have four pairs of legs and are, therefore, not true insects, which always have six legs, but are classed among their near relatives. The average life of the adult female is about two weeks, and during this time she lays an egg or two each day. Since these eggs

hatch in about 10 days, and the first eggs often have hatched before the last ones are laid, all stages of the life cycle—summer eggs, nymphs and

calyx cup of apples as well as on the bark.

The European red mite is introduced into new sections on nursery stock.

lish it, though it may take several years for it to multiply to the point where it attracts attention. Young orchards as a rule show European red mite injury first. In old orchards, an infestation can generally be traced to a young tree planted in or near it. Wind probably spreads it from tree to tree.

The clover mite, which also infests fruit trees, produces very much the same type of injury as the European red mite. Both may appear on the trees at the same time. Since the clover mite so closely resembles the European red mite that the average fruit grower, even with the aid of a magnifying glass, cannot always distinguish one from the other, they may in practical orchard management be considered in the same class.

Control

Several parasites are known to work on the European red mite and help to hold it in check. However, it takes some time for the parasites to build (Concluded on page 37)

DILUTION TABLE for MISCIBLE OIL SPRAYS

(Manufacturers' recommendations for European Red Mite control.)

Trade Name.	Manufacturer.	Dilution Oil-Water
SCALECIDE	B. G. Pratt Co., New York City	1 to 15
CARBOLEINE	B. G. Pratt Co., New York City	1 to 20
SPRAY MULSION	Sherwin-Williams Co., Cleveland	1 to 25
GRASSELLI SPRAY OIL	Grasselli Chemical Co., Cleveland	1 to 20
SUNOCO SPRAY	Sun Oil Co., Philadelphia	1 to 25
DENDROL	Standard Oil Co. (Ind.) Chicago	1 to 20—1 to 33
KLEENUP	Calif. Spray Chem Co., New York City	1 to 20

(As the above recommendations may vary according to whether the material is to be used as the Dormant or Delayed Dormant spray, it is best to secure the literature from Manufacturer for complete instructions.)

adults—are found on the leaves at the same time. Winter egg laying starts in the latter part of August or September. Often the eggs are laid in the

Not until after it had become pretty well distributed did it attract much attention. Even a few hidden eggs on a nursery tree are enough to estab-

Some Practical Examples of Propagation By Grafting and Budding.—

IN MOST instances the farmer had better purchase his nursery plants rather than attempt to propagate them for himself. This is not because there is anything mysterious about the art of reproducing horticultural plants, as was once thought, nor is it that extreme skill is necessary to produce grafted or budded plants. Rather, it is because the nurseryman makes it his business and knows the game thoroughly, while the average farmer, even though inclined to give the necessary time and care, often cannot afford to neglect other crops. There are a few fruits, however, the reproduction of which is so simple that no one need purchase his plants if he has an old plantation that is vigorous and healthy. Such fruits are strawberries, blackberries and raspberries.

For long periods of time the ancestors of our common fruits were crossed and recrossed in the wild, which produced a great number of individuals, each differing more or less from the other. Occasionally an individual seedling could be found by man which combined certain desirable characteristics. When seeds from this individual were planted, however, it was found that the offspring were not entirely like the parent—more often they were very different and differed from each other. This was due to the mixed heredity of the desirable individual. It was found, however, that if one could get a piece of the root

While the Commercial Grower will almost invariably buy his Planting Stock from the Experienced Nurseryman, it is well to know the Underlying Principles of Plant Propagation. It is sometimes entirely Practical to Propagate from a Healthy, Vigorous Berry Plantation for Transplants.

By C B Wiggins

University of Arkansas

or a branch to take root and grow, the resulting plant was like the mother plant. In fact, it was a part of the mother plant. So it became known that fruit trees, if desirable characters were to be preserved, could not be grown from seed or by sexual means but that vegetative methods or asexual means must be employed.

Propagation by Layerage and Cuttings

Layerage is probably the simplest method of asexual propagation and one of the most often seen in nature. It is the art of propagation in which the plant stem is made to root before being detached from the parent plant. On the farm it is applicable only to plants that can be easily bent to the ground where the stem may be cov-

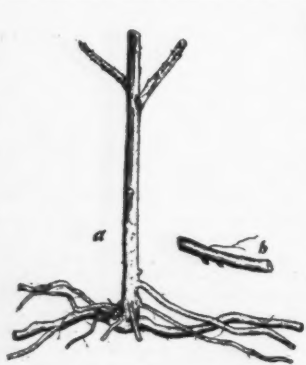
ered with soil until roots are formed. Missing grapevines in the aged vineyard can be replaced more satisfactorily by bending and pegging down a cane and covering with soil for one and one-half to two feet in the vacant space until a good root system is formed than in any other way. Such plants as snowball readily root in this way, several plants being secured from a single stem laid in a trench and all but the tip end covered.

Blackcap raspberries tip layer naturally under favorable conditions. The current season shoots bend over until the tips come in contact with the soil. Roots are sent into the soil and the daughter plants can be dug—the stems between them and the mother plant having been severed—and reset in the new plantation.

The strawberry increases itself by runners, which in a general way approaches layerage. The parent plant sends out special structures which form a rosette of leaves at every second node. Soon, under favorable conditions, roots form on the lower side of this rosette and enter the soil. By fall the daughter plant has established a root system sufficiently strong to support the plant, which may be dug up and set in a new planting, if such is desired.

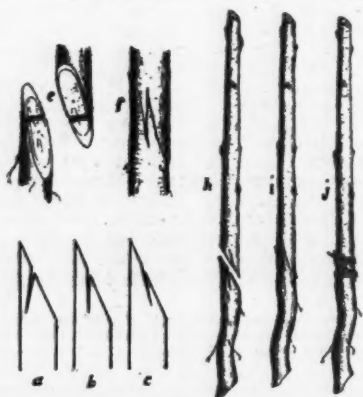
Cuttings is the next simplest method of asexual propagation applied to fruit plants. In this method plant parts, whether stems, roots, tubers, or even leaves, are detached from the parent plant before rooted. This is probably the most desirable method because it is economical of both materials and space. It so happens, however, that only a few of our fruit plants will readily grow from cuttings.

Most varieties of grapes are adapted to cuttings. In mid-winter one-year-old well-matured wood, with medium diameter and medium length internodes, is selected from the desired variety and cut into short lengths. In vigorous varieties, as Concord, the cuttings are made three buds long. (Concluded on page 31)



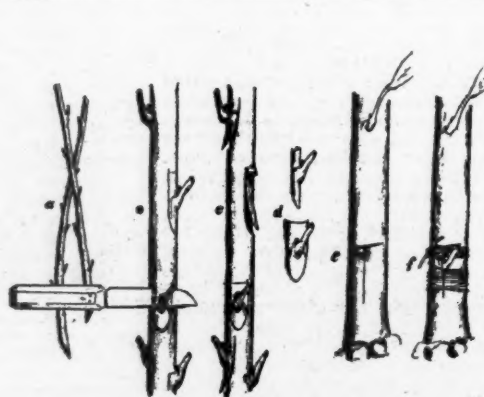
PROPAGATION OF FRUIT PLANTS BY SUCKERS AND CUTTINGS

- A well grown blackberry sucker. The large root grow out laterally from the parent plant.
- A root cutting of blackberry. For best results when using this method, the cuttings are planted in nursery rows and carefully grown one season before setting in the field.
- Grape cuttings. Well matured one-year-old wood only can be used with success. The cuttings should be made in mid-winter, calloused until spring and grown in the nursery row for one summer.



SCION GRAFTING—WHIP OR TONGUE METHOD

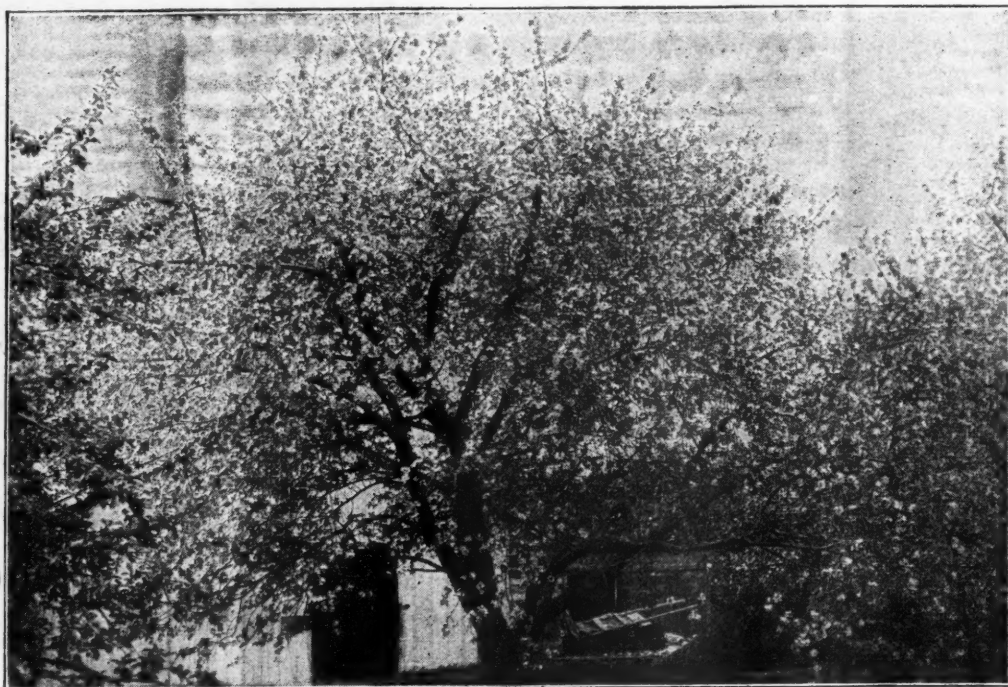
- a and b. Incorrect method of making tongue, diagrammatically shown.
 - c. Correct method of making tongue, diagrammatically shown.
 - d. Properly prepared stock.
 - e. Properly prepared scion.
 - f and g. Stock and scion ready to slip together.
 - h. Completed graft tied.
- Note: These illustrations are of apple piece-root grafting



SHIELD BUDDING PROCESS

- Peach bud-sticks prepared to be taken to the nursery.
- Method of cutting beneath the bud. Note the leaf petioles left to facilitate handling of the buds.
- c and d. Same as "b" with a bud removed. Note the chip of wood left on the bud stick. Only the bud and a small portion of bark is removed.
- e. Stock ready to receive the bud.
- f. Bud in place and securely tied. The binding should be cut on the back side of the stock about two weeks following budding.

How Pollination Increases Fruit Production



An extreme example of inter-sterility. A Minkler apple tree at Missouri Experiment Station grounds, Columbia, Mo., with enough blossoms to set a 40-bushel crop,—and seldom yields four bushels

Maryland have found that Delicious is an excellent pollinizer for the Arkansas. Trees of Arkansas growing in the immediate vicinity of Delicious trees were observed to be bearing fairly heavy crops, and

careful tests with Delicious pollen showed that it would set Arkansas flowers. These findings have been substantiated by observations of workers of several other experiment stations. The efficiency of Delicious pollen, however, apparently extends only a distance of a few trees. Jonathan pollen was also found to be of considerable value in increasing the set on the Arkansas, but in Missouri at least it has not proved as good as Delicious pollen. Grimes, Stayman and a number of other varieties which are often planted with Arkansas were found to be of little or no value as pollinizers for that variety, although the Grimes is an excellent pollinizer for many other varieties.

When Delicious or Jonathan are to be planted as pollinizers for the Arkansas, they should be planted not farther apart than every third tree in every third row. The arrangement of the trees in this manner will give a good distribution with a minimum number of trees. The same system could be followed in an established orchard, topworking the proper trees to Delicious or Jonathan.

Growers who wish to use Delicious as one of their commercial varieties might plant on the order of four rows of Arkansas and two rows of Delicious, or four of each if as many Delicious are to be set as Arkansas.

The Use of Nitrogenous Fertilizers to Aid in Fruit Setting

Because trees do not set fruit or a heavy crop, it should not be inferred that the trouble is necessarily or entirely one of improper pollination. Trees that bloom profusely but which fail to set a good crop can often be induced to do so by an application of nitrate of soda or sulphate of ammonia applied when the buds are breaking in the spring. With Arkansas, and it is probably true of a number of other varieties, the use of a quickly available nitrogenous fertilizer seems necessary to get a commercial set of blossoms even when proper pollinizers are present. A number of orchardists who in the past were unable to make their Arkansas trees set profitable crops have the last several seasons gotten fair to good crops by merely using nitrate of soda or sulphate of ammonia, and results similar to these would no doubt follow the use of these fertilizers in many other orchards.

The first step to be taken in an orchard that blooms heavily and which

POLLINATION and fertilization are essential in most cases to the setting and development of good fruit. The lack of proper pollination and fertilization is the chief cause of the failure of flowers to set and fruit to develop to maturity where serious diseases and injurious insects have been satisfactorily controlled by spraying. In some seasons, and particularly in some sections, the loss from imperfect pollination is considerable and is one of the chief concerns of the fruit grower.

To avoid future heavy losses after the orchard, vineyard or small fruit plantation has come into bearing, or to avoid the employment of such drastic measures as uprooting and replanting a part of the field or topworking many of the trees, the prospective orchardist should have some knowledge of the problems of pollination before the plants are set.

Definition of Terms

Some varieties set and develop fruit when pollinated with pollen of the same variety. Such varieties are said to be self-fertile. Other varieties do not set fruit or do not set any appreciable number of fruits when pollinated with pollen produced by that variety, whether it be from the same plant or from different plants. Such varieties are spoken of as self-sterile. Also, some varieties will pollinate and fertilize flowers of certain varieties and not others. The varieties which will not pollinate and set the fruit of another variety are said to be inter-sterile with it, and the condition between them is known as inter-sterility.

Self-fertility and self-sterility in fruit varieties have been extensively studied, but owing to changes due to environmental conditions, it is not always possible to state whether a particular variety is self-fertile or self-sterile. When grown in one part of the country and in some seasons, it may be self-sterile, while in others it may be self-fertile. Therefore, unless one is reasonably certain that a variety is self-fertile, it is advisable to plant other varieties with it which produce an abundance of pollen and which bloom at about the same time. Comparatively little work has been done on inter-sterility and not much exact information is available.

Since pollination problems and methods of handling vary with different kinds of fruits, each will be discussed separately.

Apples

The majority of apple varieties are either self-sterile or are benefited by cross-pollination. The Maine Agricultural Experiment Station out of 119 varieties studied found that only 42 set fruit with their own pollen, and that of these only 15 produced enough fruit to rate as moderately commercially profitable crops. At the Oregon Agricultural Experiment Station, of 87 varieties studied, 59 were found to

be self-sterile, 13 varieties partially self-fertile and only 15 self-fertile. Nearly all of the generally grown commercial varieties tested at the Missouri Agricultural Experiment Station were found to be self-sterile, or appreciably benefited by cross-pollination. It is evident that self-sterility in a marked degree is common in apple varieties from coast to coast. Consequently, unless one is certain that the variety to be grown will produce good crops consistently, it is advisable to plant together two or more varieties which bloom at about the same time. It is not necessary, however, or even advisable, to plant a large number of varieties unless they are being grown for local market trade.

Br H G Swartwout
University of Missouri.

The importance of planting every other row with different varieties or changing varieties every two or three rows has been over-emphasized. Some growers have received satisfactory results who have planted blocks as large as 10 acres to one variety. For best results, however, it is generally believed that plantings should consist of not more than four to six rows of one kind. Three rows, ordinarily, is the maximum distance pollen will be carried in sufficient amount to set a commercial crop under unfavorable circumstances, and it is the distance pollinizers are effective in unfavorable seasons that limits the planting distance. Failure to consider this with self-sterile varieties will result in some years in greatly reduced crops.

Alternating varieties in four or six-row blocks, when it can be done without materially reducing the crop, and it usually can, is preferable to single or double rows. The cultural requirements of the various varieties are more or less different and for best results spraying, pruning, fertilization, and other practices may need to be changed to suit each variety. Suitable adjustments, particularly in spraying and cultivation, are more easily and economically made and are more likely to be adhered to if varieties are planted in four or six-row

blocks than if alternated with every row or every second row. Moreover, in grading and packing in the field, as is common in the eastern and middle western states, six-row blocks are best to avoid the expense and annoyance of continually moving the packing equipment. With such an arrangement, the fruit may be gathered from three rows on each side of the packing table and nearly an acre harvested before a move is necessary.

Self-Sterile and Self-Fertile Varieties

When an orchard is to be set, the grower often wishes to know whether the varieties chosen are likely to be self-sterile and self-unfruitful or self-fertile and self-fruitful. While no hard and fast classification can be made, a number of varieties have been investigated thoroughly enough to permit placing them fairly definitely in one or the other of these groups. Commercial varieties of apples which in many sections have been found to be self-fruitful to a satisfactory degree are Baldwin, Newtown, Grimes, Oldenburg (Duchess), Yellow Transparent, Wealthy, Ingram and Delicious. Other self-fruitful varieties, though less satisfactory, are Ben Davis, Gano, Jonathan, Willow Twig, Esopus, Wagener, Red June, Early Harvest and Red Astrachan. Varieties which have been reported generally as self-unfruitful or nearly so are: Arkansas (Black Twig), Arkansas Black, Maiden Blush, Missouri Pippin, Rome, Ralls (Genfont), Winesap, York, McIntosh, Northern Spy, Rhode Island Greening, Winter Banana and Stayman.

The members of the Winesap group—Winesap, Arkansas, Arkansas Black and Stayman—are notoriously self-sterile and as a result self-unfruitful. The Arkansas (Black Twig) would be an excellent commercial variety if it could be induced to bear more fruit. It appears that this may be realized as the result of a recent search for pollinizers for this variety which apparently is inter-sterile with many varieties. Auchter and Schrader of

is well sprayed but which fails to set a good crop is the application of a quickly available nitrogenous fertilizer 10 days to two weeks before blooming. In addition, if there are no bees in the orchard or near by, several colonies should be introduced. Decreased crops due to too few pollinizing agents is probably more common than is generally supposed, especially following cold or wet weather at blossoming time when bees and other insects are inactive or travel but short distances.

Should proper spraying, the use of fertilizers and the introduction of bees fail to give relief from an excessive drop, branches of other varieties should be placed in the orchard at flowering time in conjunction with the above practices. The branches should be cut before many of the buds have opened and covered at least half their length with water in pails or jars which are placed at intervals among the unfruitful trees. This is only a

temporary expedient but may stave off crop failures until pollinizers can be grown in the orchard. In fact, it should be tried before any permanent changes are started to make sure that the variety contemplated as a pollinizer is effective. If satisfactory, every

that will give good results. Topworking gives quicker results than the setting in of new trees and is the better practice to follow except in very young orchards planted without proper pollinizers.

Evidence on inter-sterility in apples

The study of the influence of Pollination on Fruit Production has not in the past received the attention the importance of this subject deserves. In this and in succeeding issues of the AMERICAN FRUIT GROWER MAGAZINE, the subject will be considered in all its interesting aspects.

third tree in every third row may then be topworked to that variety which under ordinary circumstances is the minimum number of pollinizers

is at present meager. Some of the members of the notorious Winesap group are inter-sterile. The Arkansas and Stayman produce pollen of low

viability and consequently are not effective pollinizers for other varieties. The Grimes, though it is an excellent one for many other varieties, has been found of no value as a pollinizer for Arkansas. The Minkler is a variety apparently inter-sterile with most varieties, though the evidence is wholly circumstantial. Trees of this variety growing in the experimental orchards at Columbia, Mo., and so placed as to receive pollen from a dozen or more varieties, have steadfastly refused to bear more than three or four bushels of fruit, though the trees bloom profusely and are large enough to easily bear 40 bushels. Bees are present and the trees have been well fertilized, but without effect.

(Note.—In the second concluding part of this article appearing in the April number, Prof. Swartwout discusses the application of the principles of pollination to the pear, peach, quince, plum, cherry, grape and the small fruits.)

The Sweet Cherry is a Dependable Commercial Fruit

THE COMMERCIAL CULTURE of sweet cherries is largely confined to California and the Northwest, but there is a region in the so-called Grand Traverse section of Michigan which is also ideally adapted for sweet cherry culture. The sweet cherry must have protection in the winter, the blossoms must escape frost in the spring, and the fruit, while desiring a rather rapid continuous growth, seems also to require cool nights. The prevailing westerly winds across Lake Michigan, deep snow in the winter, the hilly frost free locations, and an ideal soil seem to satisfy all these requirements. However, the sweet cherry tonnage from Michigan has declined in recent years. Sour cherries are largely superseding them. These cherries are harder, more productive, and easier to grow and harvest. The sour cherry market has caused an increase in planting, with a consequent decrease of sweet cherry acreage.

The sweet cherry is almost exclusively grown for the fresh fruit market, while the sour cherry demand comes very largely from the pie baker, who uses it the year round, either in a frozen or canned condition. Yellow varieties of sweet cherries are canned to a considerable degree, but they do not pay the grower as well as the sour cherries. They are also used in the manufacture of Maraschino cherries, of which many millions of pounds are annually consumed in this country. Unfortunately, the tariff on the cheaply grown Italian cherries is not sufficient to allow American growers to compete for this business. While the quality of these cherries is delicious, they do not ship and hold up on the market as well as the dark red or black varieties. Some attempt has been made to can the black sweet cherries. However, they do not seem to keep well in the cans, and the price that can be paid by the canner for the fruit hardly warrants planting them for that purpose.

When allowed to fully ripen, Michigan black sweet cherries have a wonderful flavor. If properly grown, they have the size and appearance which will actually outsell cherries grown elsewhere. The writer believes they can be produced and marketed cheaper here than in the western states. But something is wrong! Michigan sweet cherries, usually coming after the western cherries, should have fine demand and good prices. The reverse is the case. The writer is convinced that the common practice of picking the cherries before they are ripe has been the principal reason for this condition. The growers do it for fear of loss from cracking, resulting from late rains. As the sugar and richness of flavor develop at the very last, this immature fruit soon finds a dull market and gives the region a poor repu-

Visitors to Benzie County, Michigan, who wind around the North Shore of Crystal Lake to the Rogers Cherry Orchards, come back with valuable Ideas on Cherry Culture. In this article "Gus" parts with some Interesting Information on the Sweet Cherry.

By A J Rogers

tation. This condition naturally has been a large factor in the decline in tonnage.

Sweet Cherry Culture Profitable

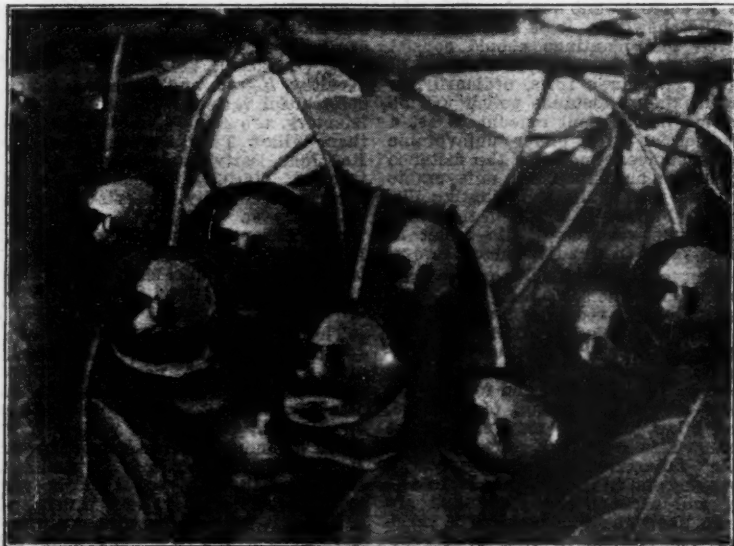
A few growers in Michigan have demonstrated beyond a doubt that sweet cherry culture is extremely profitable. With favorable conditions of growth and marketing, and a manager able to cope with its many demands of care and attention, the sweet cherry offers a better opportunity than possibly any other fruit. In many respects, it is more fickle than the other tree fruits. It is very subject to winter injury; as a matter of fact, it is about as tender as the Elberta peach. It blossoms early, so that late spring frosts and freezes often do a great deal of damage. Along with the sour cherry, it is subject to the ravages of the shot hole fungus. The lime-sulphur spray for this, unless perfectly diluted and applied, is apt to cause considerable burning of the foliage. The black cherry aphid is a mean pest to control, often spoiling the appearance of

the cherry at harvest time. Brown rot is always present and demands constant attention, both during the growing and marketing periods. Cracking of the fruit, especially on such varieties as Lambert, is so serious as to render otherwise desirable varieties worthless. A "collar" rot just below the base of the tree kills many trees.

Notwithstanding these difficulties and many others, proper attention can almost, if not quite completely, control them.

Selection of Location

In the Michigan region, one can practically eliminate the factor of frost risk by a proper selection of location. The writer knows many sweet cherry orchards that have never been damaged by frost. Conditions which cannot be dealt with are the occasional freeze which comes when the buds are swollen but still solid, and the danger of cold and rainy weather during the blooming period. These conditions prevailed in northern Michigan in 1927, causing a light crop.



The value of bees during the blooming period was well illustrated this past year. In our orchard there was a very short period, only a few hours in fact, of warm-sunshine, during the bloom. The bees had time enough to fertilize a sufficient number of blossoms nearby to produce a fair crop, but at the extreme corner of the cherry block, away from the bees, there were no cherries.

Varieties and Pollination

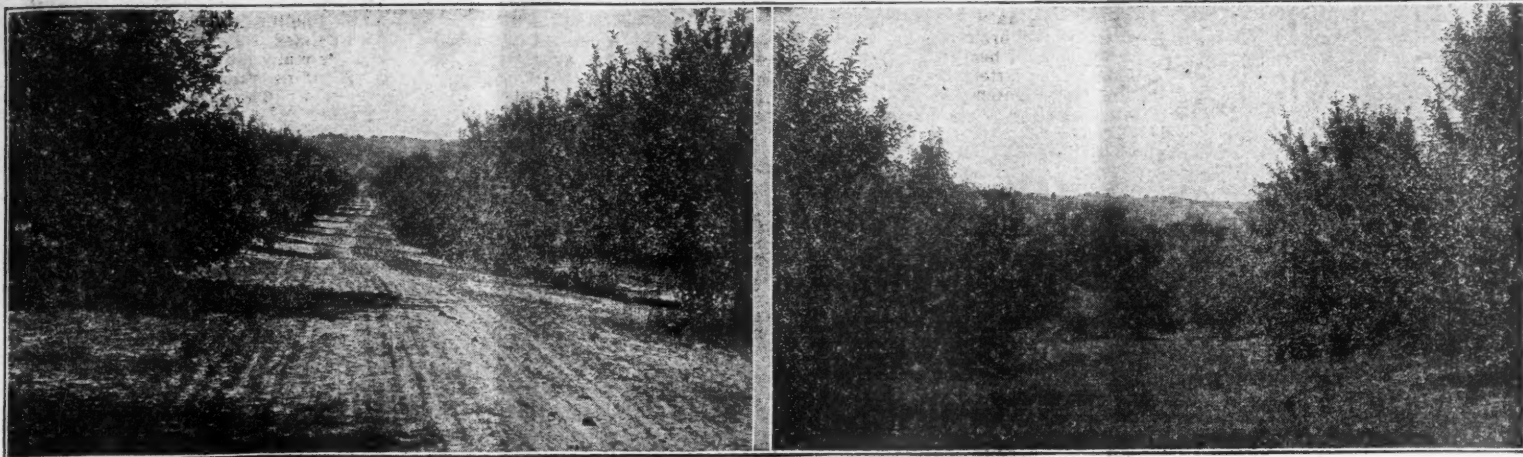
Sweet cherries should be planted to allow for cross pollination. Our best variety, Schmidt's Biggereeau, especially needs to be interplanted with other varieties to produce a paying crop. When this has not been done, the situation can be temporarily corrected by placing a liberal supply of large bouquets of Tartarians, Windsors or other good pollinizers in tubs of water throughout the orchard.

The three best varieties for us are Schmidt's Biggereeau, Windsor and Bing. The Schmidt is a uniformly large, meaty cherry of wonderful quality when allowed to mature properly. The tree is hardy and rank in growth. The fruit almost never cracks, a factor of the utmost importance, it is the least susceptible to brown rot fungus, and it ships and keeps probably the best of any variety. It has a tendency to shyness of bearing. The Bing is picked about the same time as the Schmidt and has uniformly large, beautiful fruit. The tree, however, becomes stunted after starting to bear crops and is much more susceptible to disease. Bing occasionally cracks very badly, and within a very short time after cracking, either a green mould or brown rot fungus develops, rendering the fruit unfit for consumption and a menace to the keeping quality of the fruit adjacent. As it is very necessary that each cracked cherry, however small, be culled out before packing, it is easy to see what a large factor this cracking is in selecting a variety.

The principal value of the Windsor for commercial purposes is its ability to bear uniformly large crops. It is a good pollinizer, and the tree is hardy. The fruit is more apt to crack than the Schmidt, but not as badly as the Bing. The chief fault of the Windsor is its lack of size—a very important consideration on the market.

Other varieties planted in our orchard have not proved profitable. Black Tartarian is a good pollinizer and is superior in quality, but it lacks size, is too juicy to ship, and the tree neither grows well nor bears well. Several years ago the writer pulled out 500 13-year-old Lamberts because each year there had been an excessive amount of cracking. He esti-

(Concluded on page 39)



Trees receiving cultivation with cover crop as they appeared at end of twelfth growing season. These trees were larger than trees under any other soil management system

Trees in grass but receiving annual applications of straw as a mulch were nearly as large as trees under cultivation and cover crop and have been as productive

Culture with Cover Crop, Straight Cultivation or Orchard Mulch?

Local Conditions, such as Character of Soil and Weather Conditions, make it impossible to apply any hard and fast Rules for Soil Management in the Orchard. But a General Knowledge of Results Secured under Several Systems will aid the Grower in Solving his own particular Problems of Soil Management.

By Clarence E. Baker

Purdue University Agricultural Experiment Station

THE MANAGEMENT of orchard soils constitutes one of the most important operations involved in successful orcharding. The growth and yield of apple trees depend to a large measure upon how the soil is cared for during the growing season.

Several systems of soil management are in common use among orchardists. These vary with different localities and with different conditions. In some large orchards several systems may be followed, depending upon the topography in different parts of the orchard. Clean cultivation, with or without a cover crop; grass or sod with or without nitrogen fertilizers; grass or sod supplemented by a heavy mulch of straw, or some similar material about the tree, are some of the most common methods of caring for the orchard soil.

Various investigations in many sections of the country during the past 25 years have indicated that a system of clean cultivation with a cover crop is one of the best means of handling an orchard soil in order to maintain a high state of fertility and promote satisfactory growth and fruitfulness.

Cultivation Not Always Possible

Many orchards, however, are growing on land so rolling that soil erosion makes clean cultivation impractical, even during the early portion of the growing season. In such orchards, it is necessary to provide a method of caring for the soil that will approximate the conditions prevailing under cultivation.

In 1910 a series of orchard soil management studies was begun by the Purdue Agricultural Experiment Station in a large commercial orchard in southeastern Indiana. The object of these investigations was to study the effects of different systems of soil management upon the growth and production of apple trees, and also to determine the factors responsible for any differences that might be found. These studies were conducted for 15 years and have resulted in a better understanding of orchard soil management problems.

In these investigations, clean cultivation with cover crop, straw mulch, and sod, each with various supplementary treatments, have been compared. The soil in this orchard is a silty clay, of Illinois glacial drift origin, over a rather tight, heavy clay subsoil. The topography is rolling, and the surface soil is very subject to washing. The varieties under observation included Grimes, Jonathan and Stayman. A total area of 15 acres was used for the study. This area was divided into plots for the comparison of the different systems of

with no mulch, or with only a light mulch. All three varieties responded to the soil treatments in about the same manner.

During the second five-year period, comprising the seventh to twelfth year for the trees, the same relative positions were maintained by the systems of soil management. The trees in cultivation with cover crop led in growth and production, being very closely followed by trees grown in sod with a heavy yearly application of straw, forming a thick mulch about the tree and well out beyond the spread of the branches.

Trees in sod without any mulch made the least growth and produced very little fruit. The effect of grass alone upon the growth of the trees was very outstanding. Trees that had been under cultivation for eight years and then grown in sod during the second five-year period of this study made as little annual growth as the trees that had been continuously in sod, though the former trees were much larger. In other words, the sod system of soil management retarded the growth of trees that had been making a vigorous growth while under cultivation. Trees that had been in sod for eight years previously, were given a heavy mulch of straw during the second five-year period. After they received the straw mulch, they made annual increases in growth equal to trees under cultivation or under continuous straw mulch.

The size of the tops of the trees grown continuously under cultivation with cover crop was about twice that of the trees grown in grass without nitrogen applications, at the time the trees were 12 years old.

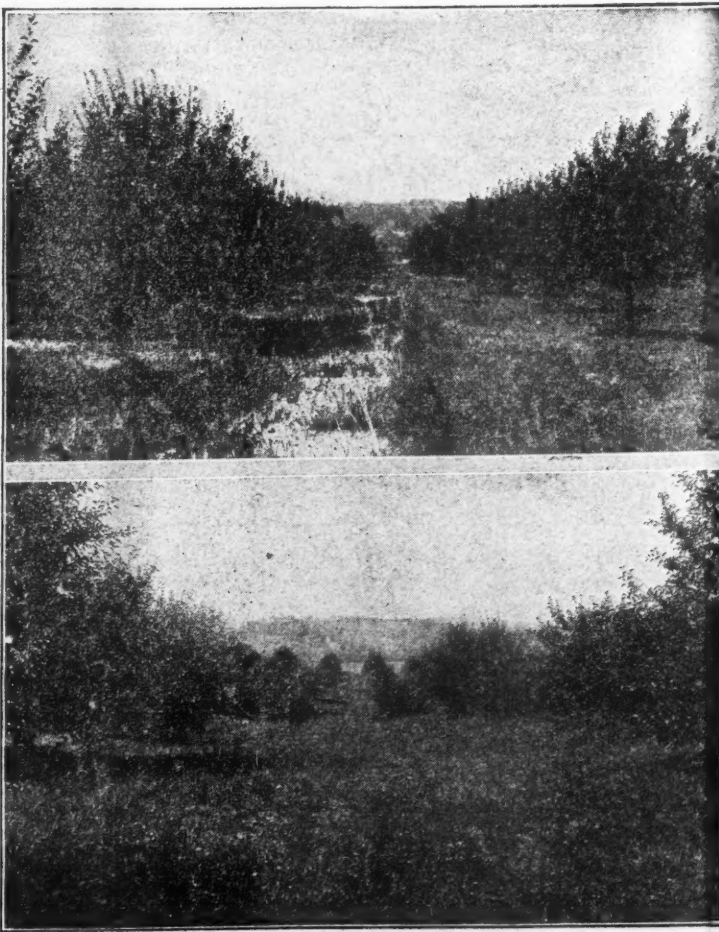
As was the case during the first five-year period, the three varieties responded in the same manner to the different soil treatments. Grimes was more productive than either Jonathan or Stayman under all treatments.

The Effect of Nitrogen Applications

Beginning in the spring of 1921, when the trees were 12 years of age, the plots were revised and nitrogen applications were made to a portion of the trees under each treatment. The remaining trees in each plot were left under the treatment followed during the first 10 years.

The effect upon trees that were growing in sod without mulch was immediate. All varieties under this treatment made a marked increase in growth the first year after receiving five pounds of nitrate of soda about two weeks before blossoming. This increased growth rate continued each year and the set and yield of fruit on all varieties were greatly increased

(Concluded on page 33)



(Above) Trees at left grown constantly under cultivation with cover crop. Those at right had similar culture the first five years but were grown in sod from then on. Photo at end of eleventh growing season. Notice difference in size of trees.
(Below) Trees that have been in sod without mulch or fertilizer at end of twelfth growing season. These trees have produced less than one-sixth as much fruit as trees under cultivation or straw mulch

soil management. The trees were one year old when the study was begun.

Straw Mulch Compares Favorably with Cultivation

During the first five-year period of

this study, trees grown under the clean cultivation with cover crop system and those under a heavy straw mulch, made 45 per cent greater average yearly gains in trunk circumference than the trees grown in sod

Can the Prune Situation Be Improved?

Probably no Fruit has suffered so much from Poor Processing, Careless Packing and Disorganized Marketing as has the Prune. Prof. Ballard outlines some Better Sales Methods.

By F L Ballard

Oregon Agricultural College.

THERE is an over-production of dried prunes on the Pacific Coast. Some say that we have under-consumption. However, that is for practical purposes a distinction without a difference, for whatever the cause may be, the export tonnage of dried prunes is annually increasing. With a normal current production of around 400,000,000 pounds and orchards enough yet to come into bearing to swell this tonnage to 500,000,000 pounds by 1930, and with a present per capita consumption of dried prunes of only 1.6 pounds annually, it requires no exhaustive calculations with paper and pencil to arrive at reasonable estimates of the annual surplus. Growing prunes for the European market, where they enter competition with some of the product of Mediterranean countries, is not a line of horticulture that holds great promise, it is believed. Yugoslavia is an important European prune region, with France a fairly heavy producer in her southern provinces.

Factors Contributing to Low Consumption of Prunes

Setting aside for a moment the export problem, there is probably no fruit that has suffered as much from poor processing, careless packing, and disorganized marketing as has the prune; in fact, so loose have been the commercial practices employed in handling this really excellent fruit that it has become long since the center of a long list of poorly flavored jokes in which the city boarding house table of second or third class usually links in. All these factors contribute markedly to the low per capita consumption of prunes. Better sales promotion practices, coupled with improved processing and packing, would undoubtedly stimulate per capita consumption considerably even though increased consumption of this particular fruit would decrease consumption of some other, assuming that the nation's dietary requirements for fruit are being fairly well supplied. Theoretically, organization and business promotion of the kind that has prevailed in the citrus industry would result in a decrease in the export surplus and perhaps improve distribution of that export volume that is inevitable, as well as domestic distribution. Such organized effort has been attempted rather sporadically from time to time, but with results only partially successful. The California Prune and Apricot Growers, with headquarters in San Jose, have led this movement in California, which state produces about five-sixths of the annual tonnage of dried prunes in this country. The California prunes are the small Petite, or Agen prune, while the Oregon and Washington crop is made up mainly of the tart-sweet Italian or Oregon prune, a fruit considerably different in character from the smaller and sweeter prune. In Oregon, co-operative effort has centered in the past four or five years in the North Pacific Co-operative Prune Exchange, while in Washington, some progress has been made in the Washington Growers' Packing Corporation, Vancouver.

Increasing concern over the surplus question has prevailed for the past four or five years and crystallized during 1927 into unusual activity in the field of prune marketing. These attempts at a new day in marketing, while interesting and significant, cannot at this time be said to have made much accomplishment beyond bringing the situation to the public mind on the Pacific Coast. About a year or two ago it became apparent that the California Prune and Apricot Growers' Association, although controlling around 50 per cent of the California crop, was not a sufficient factor in the trade to greatly improve marketing conditions. Some leaders thought the association had held out for prices that resulted in slow movement

of prunes. Brokers became discouraged anyhow, and the association became more and more dependent upon the packers.

The Parker Plan of Organization

Enter here the packers who, by all indications, were the guiding spirits in evolving the Parker plan, which now is a familiar term everywhere along the Pacific Coast. The Parker plan was, in the main, an attempt to unite the independents or growers who did

the business which, in the main, consisted of definite allotments to the various packers and arrangement of rules for classification and standardization. Arrangements specified payment of \$10 per ton to the packers on their original allotment as a basic payment, this not to include packing and selling costs. Thus was introduced what was essentially a cost plus feature.

There was considerable skepticism about the Parker plan among the



Landscape in Lane County, Oregon, showing prune orchards in the distance

not join the association, the association members, and the packers in a co-operative scheme. It was thought that with the association handling only about half of the California prune crop, with packers scrambling for the remaining 50 per cent, and with jobbers doing a hand-to-mouth buying, cut-throat prices only could be expected. Thus, with growers' co-operation having been temporarily halted in its spread of effectiveness, any experiment promising to lead toward stability was of great interest. There

leaders in California. A general attitude of "Let's try anything once" prevailed, however, and an organization campaign was launched toward signing up the required 90 per cent of the growers. Success was not attained.

Failure of the Plan

Quoting one California farm paper, "One of the reasons for the failure of the packer-grower campaign was the fact that the packers squabbled among themselves and quarreled over special rights and special favors and finally

"A federation of local co-operatives would undoubtedly be the most satisfactory type of organization for prune marketing at this time, in view of the wide expanse of territory to be covered. Co-operative effort would be of advantage to discourage price-cutting among prune packers."

were to be no contracts signed by the old co-operative association members, but the so-called independents were to be organized into the California Prune Producers, and the two separate organizations then were to have representation in a central board of directors of the California Prune Marketing Company. An agreement was to be drawn between this company and a list of packers to become effective when 90 per cent of the California prune crop was signed up. The marketing company then appointed each of the 15 packers as agents. A committee of 11, to be composed of five packers and five directors of the marketing company and an eleventh member to be elected by a majority of six, were to handle the details of

reached an agreement in some 90 pages of typed words which it was hoped would tie every recalcitrant packer to a common program. Meanwhile, they held up the membership drive to the last minute with the accounts of the scramble readily heard by the packer whose signature was sought as a partner in business."

Thus it was that a few noisy packers wrecked the plan. Meantime, the prune association is continuing its efforts to stabilize a price level, but one or two packers, it is said, have indicated that they will match every price cut with a still deeper cut.

An interesting side light on the situation is that Ralph Merritt, guiding light in the California raisin deal in recent years, in the opinion of a

rather substantial group of Californians, should be able to do something with prunes, and these people would like to see Sunland Sales Association, Mr. Merritt's organization, experiment a little.

Activities in Oregon and Washington

While all this activity was on stage in California, the Oregon and Washington people were active also. In that state, packers took keen interest in the Parker plan, but before any very definite steps were taken, a large meeting of representative prune growers and packers, known as the Convention of 100, was held at the Oregon Agricultural College. As a result of this convention and subsequent committee meetings, it was decided to attempt the Parker plan with some modifications, thought to be in favor of the growers. During the summer, however, these plans also went awry after countless committee meetings and grower conventions in the different counties. In the Northwest, one of the packer groups precipitated the wreck of the plans by early establishing a low price on dried prunes and making contracts on that basis.

In the meantime, there has developed all along the Coast a rather strong conviction that the only agency that can really assist the prune growers is the prune growers themselves. In California, half of the prunes are in the hands of the association which is without a plan, and the packers are scrambling for the other half and cutting prices to the bone. It is California which really sets the market on which the whole dried prune industry is dependent, even though the product of the Northwest is a different one.

On this point it is interesting to note in passing, that consumers are generally unaware of the difference between the Petite and Oregon prune. Of 803 housewives visited by a government investigator last year, but few realized the difference indicated. Seventy per cent of these women when asked if they knew of more than one kind of prune, indicated that they did not. One-fourth of this entire number indicated that when buying they simply asked for prunes. Forty per cent of them asked for large prunes.

Linking Up with Other Co-operatives May Prove Feasible

As the weeks have passed since mid-summer, there has been a growing demand in California for a linking up with the Sunland Sales Association. This is a non-stock, non-profit co-operative organized for the purpose of selling raisins and other dried fruits. Its main accomplishment was the moving of a three-year accumulation of raisins after the older established selling methods had proved inadequate. This organization, with its distributing arms reaching all over the world, seems to offer hope to a growing percentage of California prune producers. At the last meeting of the California Prune and Apricot Growers' Association, which resulted in a reduction in salaries of managers and officers, there was considerable discussion in favor of linking up with this successful agency.

Meantime, in the Northwest, there is a swing of sentiment toward strengthening the affiliated groups making up the North Pacific Prune Exchange. The failure of the Oregon Fruit Growers' Association some few years ago and the opposition of the packers made this movement slow, however. Undoubtedly, a co-operative movement involving 75 to 90 per cent of the prune tonnage on the Pacific Coast is the first step in the solution of the prune marketing problem. A federation of local co-operatives would undoubtedly be the most satisfactory type of organization, in view of the wide expanse of territory covered. At this time, it appears that co-operative effort would be of advantage to discourage price cutting among the packers. A second advance

(Concluded on page 33)

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F. O. B. THE FACTORIES

Spraying the Orchard from the Stationary Spraying Plant

By O G Anderson

Purdue University.

PART II

GARVER of Washington has found the average power requirements on four makes of pumps is five horsepower for one gun and about five and one-half horsepower for two guns operating at an average pressure of 295 pounds. These results were taken from a study of 23 plants. The sizes of pumps do not increase in capacity according to the needs for two, three or more guns, and this presents a difficulty in determining the size of a motor for a given number of guns. In general, the motor needs may be expressed as suggested by Garver:

Capacity of pump. Gal. per min.	H.P. of motor.
0 to 14.....	5
12 to 25.....	7½
20 to 39.....	10
25 to 49.....	15

The grower who is adapting an old outfit or is installing a stationary plant should bear in mind that the actual output of a spray pump falls as much as 20 per cent below its rated catalog capacity in many instances. In case, therefore, he has need for a pump of 20 gallons per minute capacity, it would be wise for him to invest in a pump rated at 25 gallons per minute. He should also provide ample engine power to operate the pump. Many growers have found it poor economy to buy an outfit which must be operated at top speed and at maximum pressure in order to meet requirements. Very few people operate an automobile, tractor or other piece of machinery at maximum load, yet sometimes this is done with spray machinery. New plants are installing seven and one-half horsepower motors for extra work on five and 10-acre tracts, where former installations were five horsepower. This applies to electric motors as now in use in the Wenatchee district. One spray pump rated at 25 gallons per minute is equipped with a seven and one-half horsepower electric motor. This power is supposed to be adequate at

the present time for this size of pump operating at from 400 to 500 pounds pressure. Pumps with this amount of electric power are commonly installed in five and 10-acre tracts in the West, while tracts of 20 acres or more are being equipped with 10 and 15 horsepower electric motors. Such motors should operate pumps delivering from 30 to 40 gallons per minute. A 10 horsepower gasoline engine is frequently furnished with a 20-gallon pump, and a 15 horsepower engine with a 25, 30 or 40-gallon pump.

An elaborate or expensive shelter is not essential for the plant, yet some protection for the motor, pump and tank is highly desirable. If the tank is so long that a building would be expensive, it should at least be protected from rain and snow.

Pipe Lines

The pipes selected for a stationary plant may cause trouble frequently or afford much satisfaction. The usual troubles from improper selection of pipe include too small a waterway, too few good unions, too many and too short elbows, and unsatisfactory second-hand pipe.

Well-built stationary plants have pipe lines still in operation after 15 or 20 years. Of course, repairs are necessary, but installing plenty of pipe unions, for instance, in the beginning, makes later repairs easier, cheaper and more durable. Heavy iron pipe galvanized inside and out, also reamed to reduce friction in the waterway, adds life and satisfaction to the system.

Three classes of pipe may be found on the market, known as standard, extra strong and double extra strong. Standard pipe has a safe working pressure of 617 pounds on pipe three inches in diameter. As the pipe di-

ameter decreases, the safe working pressure increases. For one and one-half-inch pipe, the safe pressure is 763 pounds; for one and one-fourth inch, it is 843 pounds; for one-inch, 1011 pounds; and for one-half-inch, 1298 pounds. All of these pressures are higher than any likely to be developed in spraying at this time. Standard pipe can, therefore, be used safely, judging from pipe tests made with Barlow's formula.

The size of pipe to use is the next

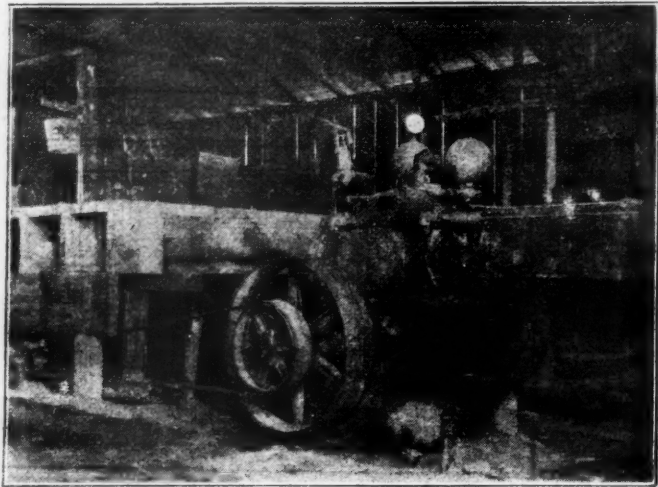
fourth to one and one-half-inch mains and three-fourth to one-inch laterals include most installations above 10 acres.

The loss in pressure due to friction in long lines of pipe plays an important part in the diameter of pipe selected for any orchard. Williams and Hazen's hydraulic table for pipe 15 years old would approximate spraying conditions.

TABLE SHOWING FRICTION LOSS IN POUNDS PER SQUARE INCH PER 100 FEET OF PIPE.

Pump capacity. Gal. per min.	Inside diameter of pipe.			
	¾ inch.	1 inch.	1¼ inches.	1½ inches.
5	4.5	1.4	1.3	...
10	16.5	5.06	4.3	...
15	...	10.8	9.3	1.3
20	...	18.2	15.8	2.3
30	30.2	4.8

Three-quarters or one-inch elbows have a frictional loss equal to six feet



A sheltered plant belonging to Charles Repp, Glassboro, New Jersey. The land is level and the soil sandy.

problem confronting the grower. According to Garver of Washington, most orchards up to 10 acres use one-inch mains and three-fourth-inch laterals. This is satisfactory where lateral pipes are not more than 500 feet long. One gun is about all this size of lateral will supply. One and one-

fourth or one and one-half-inch elbows about eight feet.

In hillside orchards, Garver states the pressure loss in pipe lines is 0.43 pound for each additional foot of elevation. Globe valves offer a resistance equal to 25 feet of straight pipe. Because gate valves have much less friction, they are generally used.

Standard fittings and valves do not withstand as high pressures as standard.

(Concluded on page 41)

Leathermann Brothers stationary plant, Rada, West Virginia, sprays 400 acres of orchard located on two mountain slopes. Top elevation from plant 395 feet. Orchard seven-eighths mile long. Cost of plant less than \$9000.



The Relation of Root Growth to Top Growth

By M. E. BEMIS

Phoenix, Ariz., Chamber of Commerce

WHAT happens to the roots of a tree when the top is making its heaviest growth for the season? No one knows, but at least a very good start has been made in finding out. There is being carried on at the Boyce Thompson Southwestern Arboretum what is without doubt the most elaborate system of root studies of trees that has ever been undertaken anywhere in the world.

The Boyce Thompson Southwestern Arboretum is located near the small mining town of Superior, Ariz., and about 70 miles east of Phoenix, the state capital. The institution, which is primarily for plant research and experimentation in the habits of plant and tree growth, is financed by Col. William Boyce Thompson of New York, who is also the founder of the Boyce Thompson Institute for Plant Research in Yonkers, N. Y. The guiding genius is Prof. F. J. Crider, formerly head of the Horticultural Department of the Arizona State University and at present a member of the board of regents of that institution.

Root Growth Made When Top is Dormant

Prof. Crider began studies of root growth of citrus while heading the Horticultural Department of the Arizona university. The work is being continued on a more elaborate scale now and will be continued until certain definite facts have been proved beyond question. The studies in root growth of citrus trees have shown beyond doubt that the periods of growth of top which are so characteristic of citrus trees is alternated with periods of dormancy of the roots. In other words, when the top is making that rapid growth which indicates a healthy state, and which is so pleasing to the owner, the root is entirely dormant. The root growth is made at a time when the top is entirely dormant, each of the several growths being alternated by periods of growth and dormancy of the roots. In Arizona, there are usually three periods of top growth of citrus trees. Prof. Crider believes that with a little more observation and studies of water requirements and other essentials it will be possible to ascertain just when and how to fertilize, to prune and to cultivate.

The studies in deciduous fruits have not progressed quite so far, but it has been found that in this climate, and perhaps in all, certain deciduous trees, particularly apricots, make a growth of roots during the winter when the top is entirely dormant. This growth is not continuous during the winter and further studies will be necessary to "unearth" the secrets which the trees hold. It is extremely interesting to note how fast the roots of some trees grow as compared with others. Of the trees under observation, the Palo Verde, a native tree of the Southwest, has made the most rapid growth. It grows under semi-arid conditions, but adapts itself to irrigation and cultural conditions and has become a valued ornamental tree.

Boxes With Glass Sides Used

The first experiments in root studies were made in wooden boxes about three feet square and six feet deep, with one side of glass, which was covered except during the brief periods necessary for daily observation. These boxes served the purpose very well, but it soon became apparent that if extended experiments were to be conducted, a more permanent system would be necessary. The experiments which are now being carried on are being conducted in concrete boxes six by six feet and six feet deep. A part of one side is set with glass and the glass is covered with a wooden door. This will permit of observation of the same tree for a longer period, because it is inevitable that the roots would soon fill the smaller boxes. In addition to the mere study of roots and

their growth, recording thermometers are taking the temperatures of the soil at root depth, so that these temperatures may be compared with the daily temperatures of the outside atmosphere.

Most of the surface of the ground in the new experimental boxes is covered over so that the amount of

moisture used is accurately determined. This data will also be used in making a final analysis.

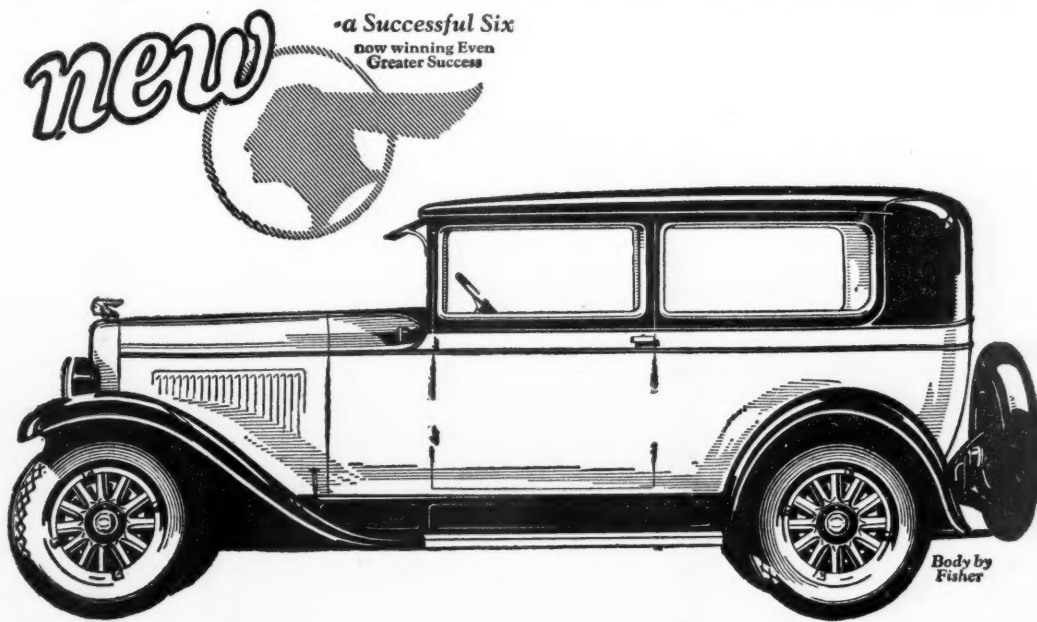
Many Other Subjects Being Studied

The study of root growth is only one of many projects which are being carried on at the Southwestern Arboretum. There are now growing under observation between 4000 and

5000 plants, shrubs and trees, gathered from the hot, dry climates of the earth and transplanted here for study. Some of the plants native to our own Southwest, such as the Palo Verde, are being cultivated, and some are proving of value from an economic or ornamental standpoint.

Much interest has been developed not only by Prof. Crider but by horticulturists of the Southwest in a grapevine which had its origin in Africa and which has a bulb root. The be-

(Concluded on page 21)



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PONTIAC SIX

NEW SERIES

A Little Journey Among the English Apple Growers

By George B. Fiske

United States Bureau Agricultural Economics.

SOME OF US visited a few English orchards during the American Farm Bureau Federation tour of northern Europe last fall. The first thing our farmers noticed were the high trunks of most orchards. There were some of the best orchards with trunks only two to three feet high, in American style, but as a rule in Kent county, the leading fruit section of England, and in other sections too, as we were told, the lowest branches were started five or six feet from the ground. Even an English fruit grower who had spent 18 years in the apple region of our northwestern states was starting his young trees with these high trunks, and the Americans naturally inquired the reason.

High Trunks

"When I first came back to England," said this grower, "I was strong for the low trunks, but now I have become convinced that the high trunks are a part of the whole English system of apple growing and are well adapted to the conditions. It is partly a matter of climate. While rainfall usually is not especially heavy, we have a great deal of rain during the

summer and there is water enough not only to keep the trees growing, but to support a growth of grass under the trees, provided it is kept short. The only cheap way to keep it of the right length is to put sheep in the orchard. But if we pasture the orchard this way, the sheep can damage the trees unless we keep the branches out of the way, hence the high trees. When we want to break up the sod, there is another advantage in the high trees which enables us to do this plowing better. Richness of the soil is another reason. Many of our orchards are planted in old hop fields. That is a crop which requires very heavy manuring for many years and the soil becomes extremely rich, so that apple trees are likely to grow too fast and make too much wood and too little fruit unless we check their growth at the right age by putting the land into grass. At first, on returning to England, I started with clean cultivation, but I found that some of my trees were making much wood and no fruit.

I had to seed down to start them to bearing."

The American growers were not fully convinced of the benefits of sheep in orchards. It is one of those points which have been commonly settled the other way in this country. English growers at least are quite well agreed that the young trees must be cultivated for a while after setting, and they also agree that if fillers, like currants, gooseberries or raspberries, are planted in the orchards, they must be cultivated or they will not pay. Sheep, grass and high trunks seem to be the summary of much of English orcharding, but on some farms, in fact on most of the large farms, hogs were being used in the orchards to some extent to break up the ground. Not many orchards were seen occupied by poultry, according to the plan so common in the eastern part of the United States. Some very good orchards were cleanly cultivated, the growers occasionally going to the extent of hand spading and grubbing to keep the

business together and put up the fruit in a packing house which is equipped with a grading and sizing machine that sorts the apples, by weight, into three sizes. Most of the fruit here is put up in willow baskets or hampers holding half a bushel. The entire contents is ring packed and the top faced with a slight bulge. The trouble with these containers is the difficulty of getting them back in good condition. Some of the apples are packed in shallow trays of only one or two layers. These are for fancy fruit and sell at fancy prices. Then there are various other hampers and crates.

Selling Apples

Good fall apples were selling at the time of the visit at about \$2 per bushel. These were the Worcester Red Pearmain which seems to be the best of the English fall varieties, although not very high flavored and too hard in flesh for the taste of many consumers. It is one of the few English apples which color up a deep red even in a rainy season, and it is a juicy fruit, sold mostly for eating. It is an apple of small size, a feature well adapted to English retail trade.

They drove the Fake Salesman from the County

An Advertisement of the American Telephone and Telegraph Company

THE wife of a farmer near Cincinnati, New York, bought some silverware from a salesman who represented it as made by a well-known manufacturer. After he left she discovered that the spoons were of the sort that can be bought for 5 or 10 cents. Her husband immediately went to his telephone and warned all of his neighbors. Then he telephoned the sheriff at Norwich, N. Y., and the fraudulent salesman was driven from the county.

The telephone is the farm guardian in every sudden need. It calls the implement repair man. The doctor. The veterinarian. It finds out where and when to sell for the best price. Runs errands. Pays for itself many times over.

The modern farm home has a telephone.



High trunks and sheep pasturage are part of the prevailing orchard system in northern Europe. S. H. Thompson, president of the American Farm Bureau Federation, is in the orchard, at the left

ground clean where the trees were too thickly set to permit the use of horse tools.

Yankee Ways in England

Before finishing with this English grower, with the American experience, it should be said that he brought back many useful ideas from the Northwest. For instance, he has his own cold storage plant and stores his late-keeping varieties at a cost very much less than charged by commercial storage plants. The high charge for storing apples is one of the very weak points of English fruit growing. Some of them, at least, charge per bushel about 20 cents a month, which would bring the cost of long storage beyond any probable gain in price. For this reason most of the English crop is sold rather early and the market left open to American apples in the spring. The climate seems rather favorable to natural storage. The weather becomes fairly cool in the fall and stays cool enough, without extremely low temperatures, all winter. Still there is not much left on the market in spring except the Bramley, a rather coarse, greenish cooking variety, and not a very great quantity of these in most seasons.

Another feature which this grower brought into his marketing system was the use of the western boxed package and style of pack. He does considerable of this work himself, but his help is learning the method. This pack is said to top the English market in its class.

Another farm a few miles away has no less than 2000 acres of fruit in one area. It is a farm operated by three or four brothers, who carry on the

The fall eating apples are all sold by the pound and very many of them to people of small income anxious to buy as many apples as possible for their fourpence (eight cents). A pound of apples about two inches in size would run perhaps eight to the pound. The peddler weighs them out very carefully and if they come a little over weight, he takes out an apple and puts back a smaller one. Plainly, it would be hard to sell exact pounds and half pounds with large apples, and a great many of the sales are only half a pound. With such a market for small apples, there is little left for the cider mills. Not much rotten fruit was in sight, notwithstanding a very wet summer and fall. There was no sign of a brisk trade in sweet cider, as seen in most American apple regions. The cider trade seems to be for the treated and bottled article at rather high prices and meeting a very limited sale.

Filler Crops

The common plan seemed to be to use filler crops of other fruits, even currants, gooseberries and blackberries. Black currants are very popular in England and are a vigorous growing bush which does fairly well in orchards. The various bush fruits last about eight years and by that time the trees are likely to need the space, although some orchards were seen which had evidently had another setting of filler fruits. Some of the orchards are on leased land and the growers do their best to get their money's worth by growing something under the trees. The growth in this moist climate, with the well manured soil, seems to be faster than in the states. Trees eight years old looked

about the size of average 10 or 12 year old trees in the eastern United States. The growing season starts later and lasts longer than in the northern states, and there is usually no summer drought.

Dwarfs and Near Dwarfs

The American visitors were greatly interested in the experience of English growers who have new kinds of dwarf apple stocks. The great advance being made in this direction must be credited to the experiment station at East Melling, which has been growing and testing these stocks for nine or 10 years. After trying a large number, they have settled down to five as being the only ones worth general cultivation. Apples grafted on these stocks produce trees varying in size all the way from bush-like affairs, never exceeding five or six feet in height, to trees reaching regular orchard size but having the early bearing qualities of dwarfs.

These dwarf trees are perhaps the most remarkable recent development in English orcharding. They are very popular among growers who rent their land and wish to get apples at the earliest possible time. Some of them set out whole orchards in the small dwarfs, which start bearing two or three years after setting and are about through in 20 or 25 years. Others use these small dwarfs for fillers. In orchards of large trees, there is an advantage in having fillers and orchard trees all of the same fruit and the same variety, so that they may be all sprayed, tended and harvested in about the same way. Some of these remarkable dwarf stocks are being tested in America. The conditions are somewhat different, because the dwarf tree will not make as vigorous growth in the American climate, but it seems quite likely there may be a place for such stocks as the numbers 13 and 16 which were seen by the visitors at the East Melling station. These made a heavy growth of wood, but bore good crops at an early age.

Some of the other work of this experiment station may have a bearing on American fruit growing, as, for instance, the superior hardness of peaches grown on certain plum stocks, also, better orchard trees made by grafting both sweet and sour cherries on the Mazzard rather than on the Mahaleb. The station has circulars describing this work, which would probably be sent on application to anyone desiring them.

Pipe Spraying

The objection to closely planted orchards from the point of view of the spraying operations does not apply, because most English orchardists spray through temporary surface piping which leads from the pumping engine outside of the orchard up through the rows and is tapped at intervals for attachment of spraying rods, so that about six rows are sprayed from each pipe. Then the pipe is laid six rows farther on and the process repeated.

More Business Orchards

The English apple crop is light this year, but not so light as was supposed the first of the season. There was a good crop of the Bramley, the principal late keeping kind, but the other varieties are pretty much out of the way by this time. Growers in Kent county seem to agree that in their principal commercial sections the planting of apple orchards is rapidly increasing. One of the best growers said that the area had doubled since he began business 10 years ago. On the other hand, many of the old, almost worthless orchards, from a business point of view, have been dying out, so that the reports of the orchard area do not cover the situation. The fact is that, without changing the acreage much, the English grower has been getting the industry into much better shape by planting good new orchards in the place of closely-set, small and neglected orchards, thus repeating the process which has taken place the past 30 years in many of the eastern apple sections in this country.

Proportion of Lime and Copper Sulphate for Bordeaux

THE RESULTS from an interesting experiment on the proportions of lime and copper sulphate and the method of mixing in the making of Bordeaux mixture were recently reported by E. D. Holland, C. O. Dunbar and G. N. Gilligan of the Massachusetts Agricultural Experiment Station.

In the experiments, lime water, precipitated lime, milk of lime and hydrated lime were used as forms of lime. The first two forms would not be practicable for commercial use and these may therefore be disregarded from a practical viewpoint.

The milk of lime was prepared by carefully slaking a high grade granulated lime. This was screened or run through cheesecloth to remove coarse particles.

In view of the difficulty of preparing Bordeaux with milk of lime, commercial hydrated lime was employed as a

substitute. Agricultural lime was found unsuitable, but some brands of plasterers' or finishers' lime that were fairly soft and bulky and free from grit were fairly satisfactory. The dry hydrated lime was allowed to soak in water over night before being used.

Judged from the standpoint of suspension, the best ratios of active lime, copper sulphate and water were found to be as follows:

Milk of lime.....	4 lb.
Copper sulphate.....	2 to 2½ lb.
Water.....	50 gal.
Hydrated lime.....	4 lb.
Copper sulphate.....	2 lb.
Water.....	50 gal.

In regard to the method of mixing lime and copper sulphate in the making of Bordeaux, judged also from the standpoint of suspension, it was found best to pour the dilute copper solution into the concentrated lime mixture or to pour the dilute copper

solution and the concentrated lime mixture simultaneously into a third receptacle.

The investigators concluded that some of the better grades of hydrated lime are promising substitutes for milk of lime but require soaking before being used.

Never Thought of That

The two Englishmen had had wonderful luck in fishing. One suggested that they ought to mark the place, in order to find it the next time. The second agreed, so he took a piece of chalk from his pocket and marked the side of the boat with a cross.

"Why, you silly donkey," said the first Englishman, "how do you know we will get the same boat the next time?"

DENDROL

An Improved Dormant Spray Oil

Four years' work in the field and laboratory resulted in the development of DENDROL, a superior insecticide for controlling various orchard insects by dormant and delayed dormant spraying. It registers an unusually high kill of insects that winter on the trees, and has been found exceptionally effective in controlling the European

Red Mite

This insect, one of the most destructive pests the orchardist is called upon to fight, is becoming a positive menace in many new localities. It attacks apple, plum, cherry, peach, almond, and citrus trees, causing great damage to trees and fruit. To control it, the highest possible percentage of kill is important, because of its great reproductive powers; a few overwintering eggs may increase so rapidly that a serious infestation will develop. The most effective control, so far discovered, is an oil spray. DENDROL is unrivaled for its great killing powers. DENDROL has great spreading and penetrating properties. The oil film is persistent; is slow to volatilize. Cost of control is less because DENDROL kills more.

Use of DENDROL for control of European Red Mite has consistently shown that 4% (1-25) dilution in dormant application and at 3% (1-33½) in delayed dormant application gives completely satisfactory commercial control. For peach trees, a dormant spray of only 3% is recommended.

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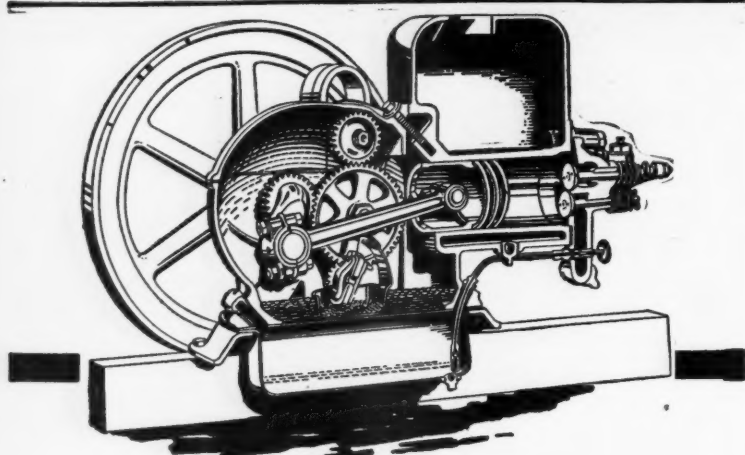
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Look Inside of The John Deere Engine

HERE'S a cross-section view of the John Deere farm engine. Study its simplicity, its complete enclosure of important working parts, its automatic oiling system—then you will know why

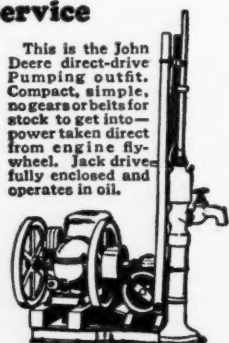
It Lasts Longer—Gives Better Service

The John Deere is the only farm engine that is automatically oiled. You can fill the fuel tank, start the engine and let it run without attention until the fuel is exhausted—no grease cups or sight feed oilers to fill—no oiling worries. The dust-proof case—like the crank case in your car—keeps all dirt, dust and sand out of bearings, gears and friction surfaces—the John Deere lasts longer.

It's the ideal engine for the children and women folks—there are no exposed gears, or extended shafts to catch the clothing.

See the John Deere Farm engine and the John Deere pumping outfit at your John Deere dealer's store. Ask to see all the features that make it an ideal farm power unit.

We have a FREE booklet describing John Deere farm engines and a copy of our "Handy Farm Account Book" ready to mail at your request. Write, today, to John Deere, Moline, Illinois, and ask for Booklets WA-71.



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The Market Review

By PAUL FROELICH

United States Bureau of Agricultural Economics

TAKING a long look forward, the United States Department of Agriculture has given fruit growers some very pointed suggestions as to future prospects. With due allowance for increases of population, it appears that there is some danger of excessive production of certain kinds of fruit. Separate, detailed outlook reports for 1928 have been issued on seven fruits and melons: Apples, citrus fruits, grapes, peaches, strawberries, cantaloupes, and watermelons. Copies of any of these reports can be had directly from the Department of Agriculture at Washington.

The Situation Summarized

Production of most fruits and melons has reached a point where it is difficult to market these crops at satisfactory prices in years when weather conditions are favorable for good yields. Because of adverse weather conditions, the 1927 fruit crop was the smallest since the light crop of 1921. Production of the leading fruits and melons combined in 1927 was about 13 per cent less than the average of the preceding five years and 27 per cent less than the very heavy crops of 1926. In quantity, the production for last year totaled about 11,000,000 tons, compared with some 15,000,000 tons in 1926 and an average of 13,000,000 tons during the five-year period, 1922-26.

Imported fruits, especially bananas, are an important factor in market supplies. The quantity of bananas brought into the United States annually has increased steadily during the last 10 years and in 1927 was 89 per cent greater than the volume imported in 1918. The importance of bananas in our markets is indicated by the fact that, for the five-year period ending with 1927, imports of this fruit in terms of carloads approximately equaled the carload apple shipments of the same period.

Fruit production has been increasing rather rapidly during recent years and has now reached a point where large quantities—particularly of apples, peaches, grapes and grapefruit—go to waste in years of heavy production. The increased production is the result of large plantings induced by periods of high prices, and further stimulated artificially in some areas by those who had land for sale or who were otherwise financially interested. The apple industry, for example, is still suffering from the excessive plantings during the boom period, which followed the short crops from 1907 to 1910 and which practically ended when the crop of 1912 was harvested. In the Southeast, peaches were over-planted during the years 1921 to 1924, following several seasons of high prices, and the present grape situation is the result of the excessive plantings in California which have just come into production. During the past year or two, fruit planting has proceeded on a moderate scale, except that the good prices resulting from recent short crops of citrus fruits have unduly stimulated real estate promotion and grove planting in certain areas.

Heavier Crops Expected

Prospects are for a marked increase in bearing acreage of oranges and grapefruit and a larger increase in their production in years when growing conditions are favorable. Additional plantings are discouraged for the present. A repetition of the light 1927 crop of apples, peaches and pears is not likely to occur, and therefore heavier production of these fruits may be expected under normal conditions this year. Due caution should be observed in the setting out of new orchards. Early relief from the problem of marketing a very heavy tonnage of California grapes can be seen only in

a prompt reduction of acreage. Increased grape plantings in other states scarcely seem to be justified. In view of the heavy losses experienced when an excessive acreage of fruits is planted, it is hoped that future plantings will be influenced more by the long-time prospects for the fruits in question and less by temporary conditions.

It should be recognized that the area of potential fruit land is so great that continued pressure of heavy supplies of fruit on the markets and keen competition among the various fruits may be expected. Consumers are demanding higher quality than formerly in their fruit purchases, and substantial premiums in price are being paid for the better grades. This fact is tending to raise the average quality of market supplies and is worthy of careful consideration by growers in planning their production program.

Citrus Moving Rapidly

The Florida citrus season is running two or three weeks in advance of last season's developments. Movement of earlier varieties of oranges is finished, and Valencia's are now getting under way. Shipments may be expected to show a downward trend until the final cars in June or July. On the other hand, output of California oranges usually reaches its peak in April, and then tapers off. Forwardings of all citrus fruit have been increasing during recent weeks. Florida grapefruit was bringing a better price at shipping points than a month ago and, at this writing, registered a top of \$4 per box of desirable-sized fruit. Though oranges had declined, the market showed a firm undertone and as much as \$4.25 was being received for best lots. Florida growers and shippers have had a very successful season so far, in spite of damage and loss of considerable fruit as a result of January freezes.

The arrival in Liverpool, England, of the first direct boat shipment of citrus from Jacksonville, Fla., created no little interest among the trade. The 6000 boxes—mostly grapefruit and almost wholly under refrigeration—arrived in excellent condition after a 16-day voyage. The British market was rather weak when this cargo arrived, and a considerable portion of the consignment was placed in cold storage to await possible higher prices. The fact that the fruit could be stored longer was evidence of its good condition. Sizes of the fruit in this first direct shipment were not entirely suitable for the British trade, but this matter can be corrected and the boat movement of Florida citrus directly to foreign markets should prove of considerable benefit to the industry in that state. A recent news item indicates that a second cargo of 7000 boxes has already left Jacksonville, and apparently a regular schedule of sailings will be established.

The Strawberry Outlook

If no great changes are necessary later in the preliminary report of strawberry acreage, a heavy crop can be expected under favorable weather conditions. The indicated commercial acreage for harvest in 1928 shows a total of nearly 200,000 acres, compared with 188,000 last season and 176,500 in the bumper year of 1924. This is an increase of only six per cent over 1927, but, with yields as high as those of 1926 or 1927, would result in a record-breaking crop, even exceeding the high figure of 342,000,000 quarts established last year. Five early-shipping states together have an indicated acreage increase this season of seven per cent; six second-early states an increase of nine per cent, while the gain in the important intermediate region is four per cent. The late states, from New York to Wisconsin, may have

slightly less berry acreage this season, and most of this crop is sold locally. In the West, Washington, Oregon and Utah together show a 20 per cent increase, the largest gain for any state being in Oregon. A considerable part of the western crop, however, is canned or packed in barrels, and does not affect the fresh fruit market. Among the states which ship largely to city markets, most of the expected increase of acreage is south of a line drawn from Virginia and Maryland southwest to Arkansas. Missouri still leads with 27,300 acres, and Louisiana ranks second with 23,200, followed closely by Arkansas. Though yields in some sections last year were reduced by freezing temperatures during the spring or by flood damage, the harvested crop had a total estimated farm value of \$50,000,000.

Apples Advance Further

Prices of good apples continued their upward swing. The most desirable market varieties advanced during the month by 50 or 75 cents per barrel and 25 cents per box. Eastern Yorks seemed to be especially strong, partly as a result of foreign demand. Including several varieties, the top prices of best eastern and midwestern fruit ranged from \$7 to \$11 per barrel in terminal markets, while Baldwins sold as high as \$6.50 f.o.b. western New York points. A year ago, shippers got about \$4 for Baldwins.

Forwardings of both eastern and western apples increased greatly after the opening of the new year, but movement from eastern shipping districts is not even half as heavy as last winter. Output of western boxes and baskets is exceeding the corresponding weekly record of early 1927.

Assuming an average wholesale market value of \$6 per barrel, the 38,000 cars of eastern fruit shipped by February 10 have an aggregate value of \$40,000,000. If all shipments of western apples had been Extra Fancy grade and had averaged \$3 per box in city consuming centers, the 40,000 cars shipped to date would represent a market value of \$85,000,000. Assuming that 95,000 cars of apples will be shipped this season and that the average market price will be around \$1500 per carload, total shipments may have a combined market value of approximately \$150,000,000. How much the growers will receive out of this total amount is another story, but most apple growers with reasonable quantities of fruit for market this season have little cause for complaint.

Active Movement from Storage

Large quantities of apples were taken from storage during January. By February 1, the commercial cold storage holdings were only 1,254,000 barrels, 9,806,000 boxes, and 2,321,000 bushel baskets. Combined cold storage stocks were 28 per cent lighter than a year ago and 19 per cent less than the February average for recent seasons. Holdings of barrels were 61 per cent lighter than at the same time in 1927, and they showed even a greater deficiency when compared with the five-year average figure. The cold storage supply of apples in boxes was five per cent greater than average for this time of the year but six per cent less than last season. Nearly two-thirds of the boxes were still in Pacific Coast states. Baskets have been moving out so rapidly that the February 1 stocks were only 14 per cent greater than those of a year ago.

Public Owes Big Debt to Bacteria

THERE are thousands of different kinds of bacteria, all so small that they can be seen only with the aid of very powerful microscopes. In fact, they are so small that it would take about 3,000,000 of them to cover the head of a pin.

Yet, small as they are, we could not live without them. While admitting that there are a few bacteria that cause disease and some others that are harmful if they get beyond our control, W. H. Wright, bacteriologist at the Wisconsin College of Agricul-

ture, insists that most of them are our staunch friends. These tiny plants are found in the air, water, food and soil, in the arctic and the tropics. They go through life with us, helping us at practically every turn.

Bacteria are of three general shapes—ball-like, rod-shaped and curved like a cork screw. They reproduce by lengthening out and dividing in the middle, producing two new bacteria. Under right conditions this process is repeated every 30 minutes, which will result in millions of bacteria if continued for 24 hours.

The real importance of bacteria is realized by only a few people. Many kinds thrive in the soil, rendering plant foods stored there available to our crops. Certain kinds live on the roots of clovers and other legumes, feeding the legumes and fertilizing the soil with the nitrogen they take from the air.

Our dairy industry and tanneries depend on bacteria. Flax and hemp, sauerkraut, and foods of many kinds require the work of bacteria before they can be sold to the public. Even

the best grades of varnish and lacquer and moving picture films depend on these tiny plants which are so small that microscopes magnifying 600 times are needed to see them.

Bacteriologists have found that a certain kind of bacteria is needed for each of these purposes. They are able to separate each kind from all others and in that way have reduced the risks in those industries dependent upon bacteria by keeping harmful ones out.

Washington Apple Growers Seek Elimination of Arsenic

ELIMINATION of lead arsenate as a spray is the objective of Anthony Spuler, entomologist of the experiment state of Washington State College, Pullman, who conducted experiments throughout the summer in the Wenatchee and other districts in regard to codling moth control.

The work in the Wenatchee district is only a part of the work along this

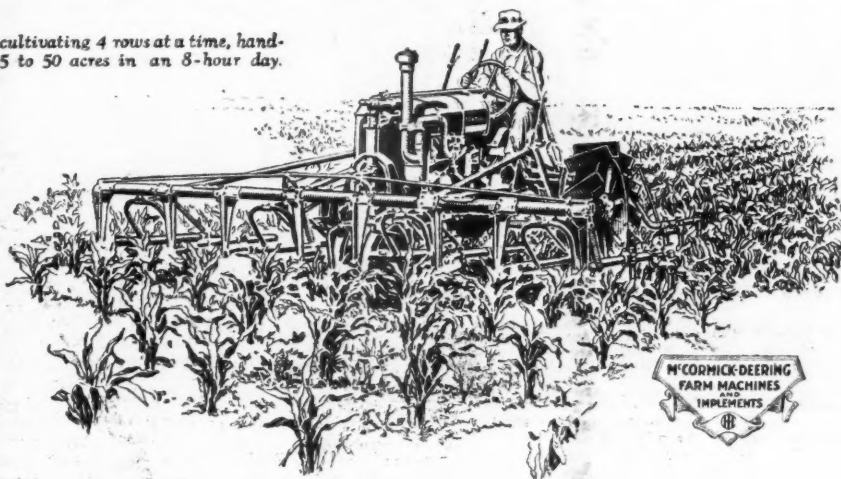
line that is being done all over the western states, according to Mr. Spuler.

"If we can find a spray which will kill the insect pests without injury to the fruit and which will not necessitate washing the fruit before marketing, we will have solved a great problem of the orchardist," said Mr. Spuler.

"That is the end toward which we are working at the present time. We are not alone in this work. Far from it, for the state college is working with us all the time and entomologists in the states of Oregon, Idaho, California, Colorado, and Montana and the federal bureau of entomology are all working on the codling moth problem.

"Along with this work, an 'insectary' will be used at the Washington State Experiment Station for the first time this year. A building will be erected at the Bushnell ranch and will be of the same type as the one at Pullman. The insectary is a building with screen sides which will be used for the breeding of codling moths for observation."

He is cultivating 4 rows at a time, handling 35 to 50 acres in an 8-hour day.



The McCORMICK-DEERING FARMALL

FARMALL is the ideal tractor for the medium or small-size farm as well as for larger farms. Until you have operated it yourself you cannot fully appreciate its fine work and easy handling, and its wonderful range of usefulness. Mr. E. S. Humphrey of Belleville, W. Va., for instance, writes us as follows:

"As you know, we bought the Farmall equipment with the understanding that we were to be completely satisfied with it. . . Am glad to say that we are more than pleased with all of it. If it were not for the many things that can be done with this tractor, I would not have bought it, as we only operate a farm of 100 acres. . . You sure hit the right name when you called this tractor the 'Farmall'."

Two and 4-row planters and cultivators, mowers, sweep rakes, middle busters, 4-row lister cultivators, beet tools, and potato machines—all are made to use with the Farmall and to fit the every-day farm. Farmall is equally efficient with tillage tools and drills, with the plow, and in all belt operations.

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Millions of farmers are using Zinc Insulated American, Royal Anthony and Monitor Fences and Banner Steel Posts because they deliver long lasting service at lowest cost per year. See Our Dealer in Your Community.

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Aphis on apple bud at Delayed-Dormant stage. Time to spray!

At the Delayed-Dormant stage of bud-growth it is important to control APPLE SCAB, SCALE and CATERPILLARS, as well as APHIS. Combine "BLACK LEAF 40" with lime sulphur and lead arsenate and control all these pests with one spraying. "Ask your Experiment Station."

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☐ SPRAYERS, or ☐ DUSTERS
(Check type in which interested)
☐ Hand, ☐ Knapsack, ☐ Barrel, ☐ Tractor, ☐ Compressed Air, ☐ Power, of about capacity.
(Purpose for which required)
☐ Orchard, ☐ Vineyard, ☐ Small Fruits, ☐ Truck crops, ☐ General Purpose. (If for any special purpose not listed here, mention what.)

☐ SPRAY or ☐ DUST MATERIALS
☐ Dormant Sprays or ☐ Dust, ☐ Lime Sulphur, ☐ Oil Sprays.
☐ Foliage or Summer Spray or Dust for ☐ Chewing Insects, ☐ Sucking Insects, ☐ Fungus, ☐ Combination Insecticide and Fungicide, ☐ Spray Chemicals in bulk, for Dusts. (List the crops for which material is required.)

Name..... Address.....

Markets & Marketing

Commercial Fruit Trade Notes

The package problem is a frequent subject of discussion among New England apple growers and dealers. That much consideration is also being given this problem in West Virginia is apparent from an article in a recent issue of the "Weekly Market Bulletin," a publication of the West Virginia Department of Agriculture, from which we quote: "For several years West Virginia growers have been considering some method of successfully competing with the fancy box apples of the Pacific Coast, which have had a strong hold on the retail markets of the East. As a start toward seeing what could be done with box apples in West Virginia, no fewer than 10,000 boxes of choice mountain state fruit were put up this year.

"The interest in the box pack as relates to marketing of apples was the reason for participation of state and federal departments of agriculture in a box-apple pack school held at Inwood during the past month. This school was in charge of the manager of a western orchard, who arranged and operated the demonstration packing house at Inwood as much like western box-packing houses as possible. A considerable number of fruit growers attended this school in person or had representatives there."

The benefits and limitations of parcel post marketing of farm products as disclosed in a study of the operation of this form of selling over a period of 14 years are set forth by the Bureau of Agricultural Economics in a publication, "Marketing Farm Products by Parcel Post," just issued by the United States Department of Agriculture, Washington, D. C.

Resignation of A. E. Mercker as chief of the New Jersey State Bureau of Markets to accept a position with the Federated Fruit and Vegetable Growers, Inc., has been announced. The vacancy has been filled by Warren W. Oley, who has been organization specialist of the Bureau of Markets.

Seven hundred eighty-one cars of grapes of the 1927 crop were handled by the Chautauqua and Erie Grape Growers' Co-operative Association, Westfield, N. Y., according to a report of the treasurer. Of this quantity, 64 per cent was sold to the trade and 36 per cent to the juice factories. Growers received a net sum of \$669,816. Of the total, 22,523,690 pounds of grapes were packed in jumbo and bushel baskets, 184,358 pounds in four-quart baskets, and 531,459 pounds in two-quart baskets. To the juice plants the association delivered 8,126,713 pounds in trays and baskets, the equivalent of 406 cars. A portion of the crop was sold under the growers' pack and a portion under the association's pack. The expense of selling amounted to \$17.79 per car, \$1.69 per ton, \$27.04 per car exclusive of juice grapes, or an expense of 3.17 per cent of net sales.

The commercial citrus crop of Florida for the season of 1927-28 is estimated at 14,500,000 boxes, of which 9,200,000 will be oranges and 5,300,000 grapefruit. This is fruit to move by rail and boat and includes the express movement. In carlots, this represents 24,000 cars of oranges and 14,000 cars of grapefruit without the express movement. For the past season, the commercial crop amounted to 16,600,000 boxes, 9,600,000 boxes of oranges and 7,000,000 boxes of grapefruit.

The storm and cold damage of the past season and the lack of rain during the spring months have all been factors in causing a light setting of fruit from the regular bloom. The setting of fruit from the heavy late

bloom, while not up to early expectations, has caused a probable increase in production, estimated at 12 per cent for oranges and 18 per cent for grapefruit. This still leaves a prospective crop of 1,000,000 boxes below the five-year average of 10,200,000 boxes for oranges and 2,000,000 below the five-year average of 7,400,000 boxes for grapefruit.

Yakima has shipped more than 4,000,000 boxes of apples, it was shown by comparison of the figures announced in the weekly report of the Yakima Valley Traffic and Credit Association, received at Spokane. Apple shipments to date were given at 5558 cars of 756 boxes each, or 4,203,848 boxes. Total shipments of fruit and vegetables for the season were 13,045 cars, of which 8742 cars were fruit and 3403 cars were vegetables.

With a bumper crop of walnuts, much larger than any previous crop, the California Walnut Growers' Association, Los Angeles, reports that more than 67 per cent of the nuts delivered to the first pool met the requirements for the Diamond grade. The remainder fell within the Emerald grade and off grades. The management makes the following statement: "Never in the history of American agriculture has a maximum crop of any non-perishable commodity been sold during the season of production and at prices profitable to the average producer. Therefore, if this season's crop is entirely disposed of before next fall, on a basis of current prices, the association will have rung up an unprecedented sales record." The association's pack amounted to over 690,000 bags, about 85 per cent of the state's crop, and 210,000 bags more than ever before. At present prices this pack is expected to bring about \$14,000,000 and the value of the shelled walnuts produced from the culls is estimated at \$1,500,000 additional. The largest previous crop, that of 1925, amounted to 480,000 bags and with the shelled walnuts brought a return of \$12,600,000.

The following circular letter was sent out recently to packers, commission merchants and dealers in apples in New York state, by R. D. Van Buran, director, Bureau of Plant Industry of the State Department of Agriculture and Markets:

"Under the apple grading law passed by the last legislature, apple grades practically identical with grades promulgated by the United States Department of Agriculture were promulgated by Commissioner of Agriculture and Markets, Berne A. Pycke. The law requires that all apples sold, offered for sale or transported for sale in closed packages, must be branded with the name and address of the packer, also with the grade, minimum size, variety and quantity of apples packed within the package. Also, the face or shown surface of either open or closed packages sold, offered for sale or transported for sale, must be an average of the entire contents of the package as to color, quantity and size.

"The law is a selling law rather than a packing law and if apples within closed packages are below the grade or size branded thereon, even if this is due to deterioration in quality since originally packed, the seller must see that they are rebranded a lower grade, to which the contents will conform. Failure to do this is a violation on the part of the seller even if he were not a party to the original packing of the apples in question.

"Please notify parties shipping apples in closed packages to you for sale, or from whom you are purchasing packed apples, to comply with this law. Also see to it that the packages

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of apples sold by you are packed and branded in such a manner as to fully comply with the law. The seller, under the law, can be held responsible for the sale of misbranded or over-faced apples, even if said apples are packed in other states."

Marketing subjects are covered by recent motion pictures produced by the United States Department of Agriculture. One picture is entitled "Co-operative Marketing in the United States," a picture which touches briefly on the history of co-operative marketing in this country, with illustrative scenes showing the handling of various commodities that are now marketed through producers' organizations.

Wells A. Sherman, who since last June has been serving as chief of the Division of Markets in the California Department of Agriculture under a co-operative arrangement between the Bureau of Agricultural Economics, United States Department of Agriculture, and the California Department of Agriculture, will return to his duties in Washington in the near future as chief marketing specialist, in charge of the fruit and vegetable division. Burke H. Critchfield, who has been representing the bureau in California, will succeed Mr. Sherman as chief of the California Division of Markets.

The fourth summer session of the American Institute of Co-operation will be held on the campus of the University of California at Berkeley, July 9 to August 4, 1928. The trustees have decided to hold the fourth session on the Pacific Coast as the result of the invitation of the University of California, sponsored by practically every co-operative association in that state.

A recent estimate indicates about a 50 per cent avocado crop in California. Most of this is made up of the early varieties, Fuerte and Puebla. For this reason, prices are satisfactory, and with careful distribution of the crop there should be little change in prices during the next six months.

The canning of fruits in the state of Washington has increased about 100 per cent in 10 years, and that of vegetables approximately 250 per cent in the same time. The record in canned fruits was reached in 1926, and that of vegetables in 1925. There are 55 canneries in the state with an annual output valued at \$15,000,000.

Trustees of the Wenatchee District Co-operative Association, Wenatchee, Wash., are considering the possibilities of new means of disposing of cull apples. Certain information and suggestions regarding canning apples were presented at the December meeting and a committee was appointed to prepare a report and present it at the next meeting.

A number of canning concerns in the Northwest have revised their plan of operation so as to include co-operative features and to put themselves in position to borrow money through the Federal Intermediate Credit Bank at low rates of interest. One question before the Wenatchee District Co-operative Association is whether it would be more desirable to establish its own cannery or to employ one of the co-operative canning establishments.

The Pomfret-Chautauqua and Erie Grape Growers' Co-operative Association, Inc., Fredonia, N. Y., marketed grapes to the value of \$102,837 during the 1927 season. The entire amount was distributed among the growers, the expense of operating the association being met in connection with the handling of side lines, such as feeds, fertilizers, salt, spraying materials, posts and wire for fences, and vineyard supplies.

Approximately one-half the grapes were marketed in 12-quart baskets,

about two-fifths went to the juice factories, and about one-tenth of the total quantity was marketed in two-quart baskets, which were packed in a central packing house. The year closed with net earnings of \$1950 and a surplus of \$3535.

For the first time in five years the United States is faced with underproduction in the cider vinegar industry, according to a statistical survey made by the American Cider Vinegar Manufacturers' Association. The association states that barrelage figures of stocks on hand, including carry-overs, as submitted on December 31 by practically all cider vinegar manufacturers east of the Mississippi River, showed a deficit of approximately 7,000,000 gallons. This indicates that there is actually on hand now less cider than the average consumption over a period of several years. Bumper apple crops since 1923 resulted in general overproduction in the cider vinegar indus-

try. Regarding this over-production and the prospects of shortage for the coming year, the report says: "In 1924 over-production amounted to approximately 57 per cent, while in 1925 and 1926 it was approximately 33 per cent, which figures must be compared with the present deficit. If there is an average vegetable and pickle crop during the coming season, and conditions point to largely increased acreage, there unquestionably will be a strong sellers' market on cider vinegar beginning with the consuming season." Reports from Pacific Coast cider vinegar manufacturers for last year's production indicate approximately half the barrelage of previous years.

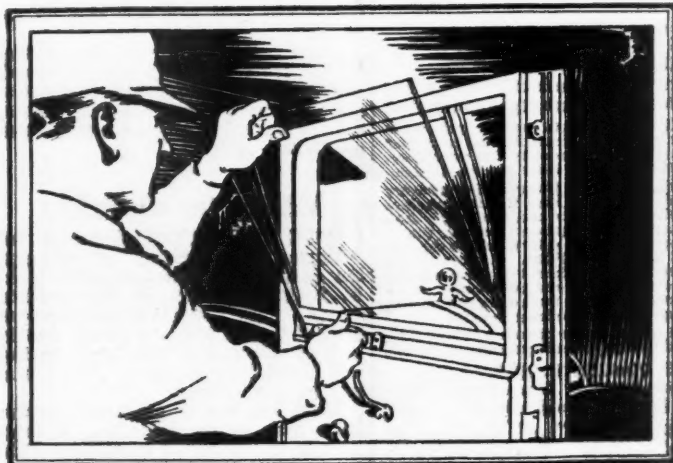
An intensive advertising campaign for Sunkist grapefruit is running on the Pacific Coast, using newspapers, radio, store demonstrations and dealer service. Weekly insertions with illustrations are scheduled in newspapers

for four months, telling of the superior quality and healthfulness of Sunkist grapefruit. A dinner hour program is being broadcast weekly over a network of stations; recipe books are being distributed, and dealer service men are helping retail dealers display Sunkist grapefruit for sale.

The California Prune and Apricot Growers' Association has added two new packs to its line of prunes and apricots. Sunsweet prunes can now be had in cellophane wraps, as a companion to the carton prune, one being a two-pound package of medium sized fruit and the other a pound of large prunes. The apricot offering is of 11 ounces. Both fruits are branded Sunsweet. Deliveries to distributors are now being made. General Manager J. M. Parker, who displayed the two packs in Chicago, was told that they would be big sellers through retail channels.

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THERE is nothing which more clearly reflects Fisher quality than the fact that genuine, selected, polished plate glass is used in *all* closed Bodies by Fisher.—You will quickly realize the higher quality of Fisher bodies if you compare the richness and clearness of the plate glass used, with the lesser attractiveness of "crystal plate"—which is not plate glass at all.—The plate glass used in Fisher Bodies differs from common glass in that it is thoroughly ground and polished on both sides, providing clear, true vision. It is, of course, far more expensive. "Crystal" glass sometimes distorts the vision. To the eyes which look through it, objects appear distorted, taking on a wavy or misshapen appearance. Distortion of this kind is unpleasant, and sometimes dangerous.



The glass used in Fisher windows and windshields is manufactured by the National Plate Glass Company, a Fisher unit, one of the world's largest producers of genuine plate glass. Its main factory is amid the white silica sands in Ottawa, Illinois. Silica sand is the chief ingredient of plate glass.—All edges are ground and polished with special machinery to eliminate all roughness.



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THE chemicals that you use in spraying fruit trees are always irritating to your throat. They may injure your lungs and impair your health—unless you protect yourself. Always wear a Dr. Willson's Dust and Spray Mask when you're spraying, treating seed, threshing, or doing any other dangerous or dusty work! This efficient health-protector sells for only \$2.25. Comfortable. Allows free breathing. If your dealer can't supply you, write to us direct and we will send it C. O. D. Address Willson Goggles, Inc., 203 Washington St., Reading, Pa., U.S.A.

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With Mt. Gilead equipment you can make apple jelly, apple butter and fresh filtered cider that will draw a profitable trade right to your door. Equipment is not costly; labor involved is slight. Mount Gilead Hydraulic Cider Presses get every last drop of juice. They have been famous since 1877 for their simplicity and efficiency. And other Mount Gilead equipment is equally practical. Of special interest to cider makers is the new Mt. Gilead Fresh Cider Filter. Removes every trace of pomace and sediment without heating, and leaves the cider clear and sparkling but otherwise unchanged. Makes fresh cider as attractive in appearance as it is appetizing in flavor.

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Fruit Farm Engineering

By E. W. LEHMANN

Electric Power for Farmers

IT GOES without saying that grain farmers, dairy farmers and fruit growers alike want electric service. They want it as a source of energy for light and power in the home. They realize its advantages in improving the farm home and making it the ideal place in which to live. Farmers know the value of electricity as a source of power and appreciate its advantages over other sources of power. Although this is true, it is also true that farmers who have had electric service in the past have made so little use of it that it has been a burden to the power companies to supply electric service to them. The income from farm lines in the past has not paid a sufficient return to justify their existence.

To justify the extension of rural electric lines, the farmers must use sufficient current to make it pay them as well as the power companies. The majority of the power companies are to be commended for their attitude toward the extension of electric power lines into the country. In a number of states, they are making a conscientious effort to determine the facts about the use of electricity on the farm. They have co-operated with the experiment stations by supplying funds for investigational work, and already a great many practical uses of electricity on the farm have been tested.

That a forward looking attitude is being taken by the electric power companies is evidenced by their interest in developing a rate that will encourage the use of electricity for all power purposes on the farm. The rural rates in the past have been developed on the basis of the small amount of electricity that has been used in the past. The rural rate of the future will be based on a larger use of electricity and therefore the cost per unit of electricity will be greatly reduced. One can readily understand this if we think of the delivery of ice to the country; if only small quantities were used, the charge would necessarily have to be high per 100 pounds to cover the losses in delivery and the delivery charges. However, if large quantities were delivered at one time, the cost per 100 pounds could be greatly reduced. So it is in the delivery of electricity to the farm; by the use of large quantities of electricity the cost per unit can be reduced.

The possibilities for the use of electricity from power lines is indeed bright. With power line extension and improved unit electric plants, a farm located at any place may have electricity.

Wiring for Electricity

CAREFUL ATTENTION must be given to the matter of wiring if the greatest value of electricity is to be realized. Many of the benefits derived from electrical conveniences are not known in many homes due to lack of attention to the job of wiring and providing adequate outlets for making connections.

When the use of electricity in the home was in its beginning, a drop light in the center of each room without a control switch was commonly found. To remedy such a condition in an old house requires a lot of unnecessary expense, since it is more costly to make changes and additions in an old house than it is to provide for them when the house is first built.

It is essential, therefore, that in new houses that are being built provision be made for ceiling, wall, floor and table appliances and fixtures. There are many appliances now available that should be kept in mind

when the wiring is being planned even though they are not to be purchased in the immediate future. Provide a special wiring circuit for the range and for the larger motors. Provide wall and floor outlets in the living room to permit the use of conveniences such as the vacuum cleaner, floor polisher, the radiant heater and fan; outlets in the dining room and kitchen for the dish washer, the coffee percolator, frying pan, the waffle iron, etc.; and outlets in the bedrooms for heating pads, curling irons, immersion water heaters, etc.

In every wiring installation the job should meet the requirements of the National Board of Fire Underwriters. Every electrician is familiar with their code. Extreme care should be observed to see that the wiring is adequate to take care of all future uses of electricity, as well as meet the standard requirements as given in the code.

The matter of safety should not be overlooked in providing adequate switches to turn on and turn off the lights. The location of switches should be such that they are convenient and may be readily found. Whenever a room may be entered from opposite sides, a switch should be provided at each point. There is always danger of an accident in stumbling through a dark room to locate a switch. This is also true of hallways and stairways.

For certain lights it may be desirable to control them from more than two points; this can be easily done by the use of two three-point switches and one or more four-point switches. A yard light is a good example of where it is desirable to have switches at more than two points. With proper switches the light may be either turned on or off at the back door, at the barn, at the front gate, or from other points.

Most of the older houses were wired with knob and tube wiring, the wire being passed through floor joists in porcelain tubes and fastened at intervals to porcelain knobs. With this system of wiring in houses already built, the wires that are passed around corners and through walls are encased in flexible conduit or loom. At the present time, the tendency in wiring old houses is to use BX cable, which consist of two or three wires rubber insulated and encased in a flexible spiral steel tube. The BX cable is attached to the outlet boxes and switch boxes by means of clamps.

In many new houses the wire is encased in rigid iron conduit or pipe. The conduit is installed and fastened to outlet boxes by means of lock nuts, making a permanent installation. The wires are then drawn through the conduits by means of a narrow steel tape.

It is considered best practice to use conduit in wiring barns or wherever there is need of protecting the wire from dust or dampness, or when it might come in contact with hay or other inflammable material.

Mass Production in Farming

THE PRINCIPLE of mass production is being put into effect by an increasingly large number of farmers each year as they adopt new machines of production and new methods. To produce any product in fairly large quantities at lowest cost, it is necessary that adequate machines be provided so that the labor cost may be reduced to a minimum. The keen competition in production puts the man with proper equipment at a decided advantage, whether he is in the field or in the factory.

Mass production in the industries has made it possible for a large percent of our American families to have automobiles and have their homes

equipped with radios and the other things most desired. Nearly everyone is familiar with the enormous saving in the cost of manufacturing articles during recent years by turning them out in large quantities with highly efficient equipment, as compared with the cost of hand produced goods of a few generations ago. The cost of our present day automobile is only a fraction of the cost of the early models. Mass production makes it possible for all of us to have more of the things which add to the comfort and well being of the individual.

It is possible that there are farms that are unbalanced as far as equipment is concerned; they have too much equipment for the particular area or type of farming. The same thing is true of some manufacturing plants. However, I believe every fruit grower recognizes that to produce apples on a large scale he must have a different sort of equipment than if he has a small orchard. There are types of farming where the number of workmen required on a large area is found by simply multiplying the number of workmen on a small area by the number of times the area is increased. An example is the old method of handling the cotton crop, which required on an average one man and family to take care of about 25 acres. The planter who had 500 acres of land could easily determine the number of negro families needed by dividing 500 by 25.

When the method outlined is followed by either the cotton planter or fruit grower, he does not take into consideration the increased efficiency of modern machinery. It would be folly for the man who has a few trees, and who is equipped with hand sprayers and other devices designed to be used when there is small production, to assume that the same sort of equipment would be satisfactory if he went into the fruit business on a large scale.

It is just as illogical for the farmer to assume that he can compete with other farmers in production with out-of-date, inadequate machines as it is for the manufacturer to assume that he can compete by the use of old equipment. By the use of modern machines in the factory or on the farm, we have mass production, we have more units produced by each individual, and a higher standard of living is assured.

Attention to Equipment Improves Efficiency

THRIFT in the care of machinery and equipment has been set apart as one of the important essentials affecting the financial success of a farmer. Cost of machinery repair is one of the items of expense that must be carefully considered, and the condition of the machine is an important factor in farm operating efficiency. To economize on equipment or neglect it to a degree that the use of a particular machine becomes a time waster as compared with the use of a first-class machine is certainly false economy, as well as poor management.

When the tools are being taken into the field to do the spring work is a good time to make a mental note of what should have been done to put them into first-class condition after they were last used, with a resolve to do it next time. It would be better to do even more than make a mental resolve. Mark it down on the calendar as a reminder. A work calendar is nothing more than an ordinary calendar with some reminders to do it now. We are all filled with good intentions, but unless we actually execute them, we do not put the machinery in shape. Reminders help some.

Some plows are not going to scour so well this spring as when they were last used, for the simple reason that they were neglected. A rusty plow makes plowing difficult, time is wasted in cleaning the plows and in polishing the moldboards to get reasonably good results. A good job of plowing cannot be done with a plow that does not allow the furrow to slip smoothly from the moldboard. Plows that were pro-

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ected by shelter and a good coat of grease after they were last used, will not be power wasters this spring.

Some disk harrows are not going to be sharpened when taken into the field this spring, because their condition was forgotten. Some spike-toothed harrows will not do as good a job as they might because the teeth have not been looked after. Most harrow teeth need some attention after considerable use.

There is no question but that the farmer who makes the most money with a tractor is the farmer who is able to keep it in first-class condition without calling on a high-priced mechanic. Some tractors are not going to run as well as they should this spring because they were not carefully overhauled during the slack season. During the rush of spring work is not the proper time to repair tractors; however, it might be necessary as a result of neglect.

The sprayer may not have worked 100 per cent perfect when the first spray was applied. If it did not, it was probably necessary to stop and clean up the pump and renew the leathers and valves. The sprayer that is looked after at the end of the season will be ready when needed again. Community or co-operative sprayer outfits are just as liable to be neglected as the ones individually owned.

Accuracy in planting depends to a large extent on the condition of the equipment. This is equally true of the corn planters, potato planters, grain drills and other types of drills and planters. Some attention should be given to calibration to see that the potato drill actually plants a peck to the acre when it is set for that amount and that the corn planter actually plants three kernels to the hill when a three-kernel plate is selected. Such tests can and should be made before the machine is taken into the field. If you do not know how to do this, get instructions for your particular machine from the implement dealer or manufacturer.

The importance of proper care of machines cannot be over-emphasized. However, no fruit grower should spend so much of his time in the care of his machines that they become time wasters instead of time savers. When old machines get into the class of being time wasters, they should be discarded and replaced by new ones.

Glass Substitutes

MUCH has been written about the use of glass substitutes of various kinds for use on cold frames, hot beds and for the front of poultry houses. While I have not had a lot of experience with this type of material, the experience I have had is not as favorable as given in many reports. No doubt, there are types of glass substitute on the market that give satisfactory service; however, it would pay to be cautious in the purchase of this material, since some of it is not proving satisfactory.

Several years ago when one variety of glass substitute came on the market, a sample was secured and it was tacked onto a frame and placed on a roof, where it was exposed to the weather. This particular type of glass substitute was made of wire screen of apparently a poor quality and coated with a transparent gelatinous-like material. After the sample, which was two square yards, had been on the roof for a period of six months, it was examined, and much to our surprise, it was found that the screen was all that was left; the action of the weather had removed all of the coating. After a year and a half on the roof, the screen wire had entirely rusted away and the frame was all that was left, except a little rust.

Another variety of this glass substitute which came to my attention was made of cloth that was impregnated with some kind of material which made it somewhat transparent and partially waterproof. This material was used to cover the scratch shed of a poultry house. It was put on during late winter for early spring use. I saw it during the summer, less than

six months after it was put on, and it was entirely ruined.

If any of the readers of this magazine expect to purchase such materials for late winter and early spring use, they should take special pains to see that the material they buy is not like the two varieties described above. If any of you have had experience with materials of this kind that would be helpful to others, we would like to hear from you.

The following comments appear in an item from one of the colleges of agriculture:

"When glass substitutes are used in front of a chicken house, the cloth or screen should be nailed to a light frame which will fit tightly in the opening left in the house wall. One practical poultryman says he likes to have one sash of one window of glass so he can see out while working in the chicken house. He also likes to have one sash of muslin to give additional ventilation. He would make the other two or three windows of glass substitutes, made as suggested above. He takes the frames out entirely in the

summer time and stores them away carefully. He also takes them out on very warm days in winter to let the house dry out as much as possible."

It is quite possible that a glass substitute would last for a good many years if put in a vertical position as mentioned in this case. However, if used on a scratching shed or used to cover a hot bed, its lasting qualities would no doubt be impaired.

Electric Dish Washer

CONSIDERABLE time and effort are required to do the job of dish washing. The electric dish washer is being developed to change this work from a disagreeable chore to a pleasant task. Any job that needs to be done by hand upwards of a thousand times a year has possibilities for motor application. In tests made by the Illinois Agricultural Experiment Station, the electric dish washer saved between 30 and 35 per cent of the total time required to wash all the dishes over the hand method; however, only 75 to

85 per cent of the dishes could be washed in it. Twenty-five to 40 per cent more water was used in washing the dishes by the electric dish washer than by hand. The electric washer was not entirely satisfactory, since the dishes were not always thoroughly cleaned. The dish washer was operated once a day where it was used by a family of four persons, and three times a day by a family of seven persons. The electric energy used per month was a small item, ranging from one and one-half to five kilowatt hours.

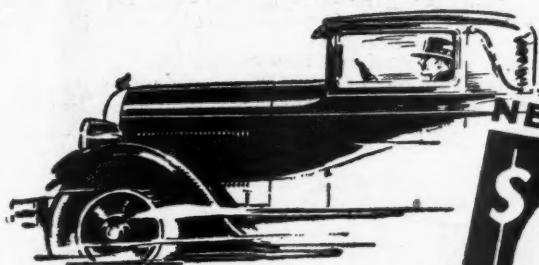
Foolish Questions

Nick: "Did your watch stop when you dropped it on the cement walk the other day?"

Nack: "Sure! Did you think it went through?"

"And were you little once like I am, grandpa?" "Of course, my boy. "Gee, you musta been a scream with those glasses and whiskers!"

CHRYSLER



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New Chrysler "52"

Two-Door Sedan	\$670
Coupe	670
Roadster (with rumble seat)	670
Touring	695
Four-Door Sedan	720
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DeLuxe Sedan	790

Great New Chrysler "62"

Business Coupe	\$1065
Roadster (with rumble seat)	1075
Touring	1095
Two-Door Sedan	1095
Coupe (with rumble seat)	1145
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Illustrious New Chrysler "72"

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are the result of many years of strawberry breeding. We have counted 43 berries, buds and blossoms on a single fruit stalk, with eleven stalks on one plant, the tallest measuring 15 1/2 inches and so stout and sturdy they held the big berries up out of the dirt and made picking a pleasure. Largest RED GOLD berry to date measured 8 1/2 inches around. The berries are very sweet and meaty with the old fashioned

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Write today and we will send you a pair of big, fat RED GOLD plants FREE at planting time. Send 10 cents for packing and mailing expense, or not, as you please. A postal will bring them with our catalogue describing our entire line of Hardy "Billard Belt" Profit Making New Fruits, Ornamentals, etc., etc.

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The HAYES New underslung trucks and cut-under front wheels give you, for the first time in any power sprayer—compactness, long life, spraying efficiency, and above all an assurance that there is practically no danger of tipping on steep hill sides. The New HAYES goes anywhere that a team or tractor can travel. Before you buy any sprayer, read about these new models and 50 others described in our catalog. Write for it.

HAYES PUMP & PLANTER CO.
857 Sixth Street, Dept. 57, Galva, Ill.

Commercial Production of the Red Currant

By GEORGE A. HAWLEY

AMONG the large list of fruits grown in this country, the currant is one of the most unimportant.

There are no statistics showing how much of this fruit is consumed, as its aggregate worth is not large enough to be of any economic concern. The visitor to the average fruit market during the currant season, which extends over a period of four to six weeks, rarely notes any considerable amount of the product on display. This indicates that there is only a limited demand for the currant.

Every housekeeper recognizes the supremacy of currant jelly over other jelly products, and many know the very satisfactory results obtained from blending the currant with other fruits, notably the red raspberry; yet a small quantity of this is sufficient to supply the demands of the average consumer. As a matter of fact, a few bushels will supply a fair sized community.

Knowing as we do that this fruit can be successfully raised over a very wide area, it would seem unreasonable that there should be much chance of profit from producing the currant on a commercial scale. Yet I venture the assertion that over the period of the past 40 years, the currant, properly grown in favorable locations, has shown more seasons of profitable production than any of our other fruits. Why this has been true in the past and probably will be in the future will be treated in a later paragraph.

It is obvious that in order to profitably produce this fruit in any considerable quantities, the location must be within reasonably quick and cheap access to large centers of consumption. The fruit can be handled in car lots under refrigeration, but there is seldom a demand for it in that manner. In 1926 we sold to a Philadelphia party a carload of currants, but this demand was occasioned by the failure of the crop in their nearby localities. The common method of distribution is through the commission houses in large centers.

Culture of the Currant

The currant bush is very hardy and can be grown in sections where the winter temperatures are too low for some of our other fruits; but on account of the blossom appearing so early in the spring, it must be planted on our best air-drained locations, where the early frosts are least liable to strike.

It is somewhat particular as to soils, probably growing to its greatest perfection in a deep clay loam. We have some that are performing well in a heavy red clay, but this soil is difficult to till and should be avoided if a loam is obtainable.

Many of our fruits can be thrown into an unfruitful condition by over-feeding or severe pruning. With the currant, I have never noted any condition where over-feeding has interfered with fruit production.

I have, however, seen some very striking results from the use of fertilizers, especially the nitrates. Were it possible to give the plantation a heavy coating of barnyard manure, with the addition of a little commercial nitrate each year, we would probably have an ideal fertilizing program. It is entirely probable that the addition of acid phosphate and potash would give better results, but of this we have no definite knowledge. We do know, however, that with a good loam surprising results can be obtained by the liberal use of the nitrates. Of course, there is a limit to the profitable amount that can be used, as such as the plant is unable to assimilate will be more or less wasted, but all that the plant can use will be returned many fold in profit through the excellency of the fruit produced. We have been using from one-quarter to one-half pound of sul-

phate of ammonia per bush, applied before the leaves open in the spring.

With many fruits we can get by with some profit on comparatively lean soils, but with currant production fertility is vital to the success of the enterprise and unless we have it in the soil, it must be supplied in liberal amounts. The currant requires fertility and clean cultivation and, having this, the young plantation will produce profitable crops for a time without pruning; but as the plants become older yearly pruning becomes a vital necessity.

Pruning

With most varieties the fruit is borne on wood older than one year. As the wood becomes older, the fruit spurs are constantly being borne in heavier clusters until it is impossible to obtain a desirable product even with other conditions ideal. Hence the first reason for pruning: removal of the old wood that has reached its limit of desirable production. If left entirely to its own development, the plant would finally fill up with this old wood and have no room left for growth, but as soon as the old branches are removed, thrifty new suckers spring up, and it is this fact that we recognize in determining our course of pruning.

The whole process of pruning resolves itself into a constant rehabilitation of the plant. As a general rule, with a majority of the currant varieties, it is not desirable to leave the old wood any longer than five years, and I am inclined to think that four years is preferable. With one variety that we grow—the London Market—it is not desirable to leave wood older than three years. So in a general way if we try to work out a rule for this pruning, it would run something like this: Each year cut away the older wood that shows an undesirable condition for production and leave about three thrifty new suckers for future development. This, like all rules, must be tempered by the judgment of the operator, depending on the condition of the individual plant, always keeping in mind the object to be obtained in the operation.

Planting Distances

The method of laying out the currant plantation is of some importance. The main fact to recognize is that from 30 to 40 square feet is sufficient space for the full development of the individual plant. Other than that, we can arrange the distance to suit the convenience of cultivation and spraying.

Most of our plantings are five by eight feet, a method that is very satisfactory with our heavy soils, because by this method we can cultivate one way with two-horse tools. But the thing which we neglected to do, and which for the maximum efficiency should always be done, is to leave at intervals a wider space to allow the free passage of a power sprayer. While the plants were young, we had no trouble getting through the rows, but now we are obliged to use dust, applied with a hand duster, a somewhat more expensive but still efficient method of controlling the pests. In a good loam, probably the nearest one could get to an ideal planting would be six by six feet with every eighth row omitted.

Enemies of the Currant

The main enemies of the currant in this community are the currant worm, shot hole fungus, and European and San Jose scales. The scales are controlled with dormant lime and sulphur spray; the currant worms with lime and sulphur combined with arsenate of lead, or with Bordeaux mixture applied just after the blossoming period, and the shot hole fungus by two or three later applications at about two-week intervals.

In using dust, the applications are applied at similar times, bearing in mind that in rainy seasons the applications should be made more often.

With our principal planting—the London Market and Prince Albert—we have never been troubled with shot hole fungus. These varieties are apparently immune from the disease. But with the Wilder, Childs, Ruby, Perfection, or Fays Prolific, the shot hole fungus creates great havoc unless properly sprayed.

Few Commercial Varieties

There are not a great many varieties of currants of commercial worth. We are growing four, but the Childs Ruby so closely resembles the Wilder that they are practically identical.

The Wilder is the first variety to ripen. This variety bears its crop of large berries in long bunches, making it easy to pick the fruit. The London Market follows the Wilder in ripening. While this berry is not as large as the Wilder, it is a very desirable variety, because it is the fastest grower and comes into profitable production sooner than the other varieties. It bears quite profusely on one-year-old wood, and when properly pruned and fertilized, the product is very fine. Probably the latest ripening currant of commercial value is the Prince Albert. This variety is rather tardy in coming into bearing but is a regular producer. The berry is medium to large in size and is usually borne on long bunches. It remains firm for a long time after turning red and is a very good shipper. This variety is very desirable in sections where the sour cherry is grown in quantities, as it can be harvested after the main crop of cherries is gone.

There are other varieties that we do not grow, notably Fays Prolific and Perfection, but our three varieties afford a continuous harvest of about five weeks.

Interplanting with Tree Fruits

The fact that the currant develops to perfection in shade makes it possible to interplant with some tree fruits, apple, pear and sweet cherry being the best. As a general proposition, the wisdom of interplanting may be questionable, as the presence of the currants will interfere with the proper care of the tree fruits. Yet there is no doubt but that with a rich loam foundation, the maximum net profit per acre can be obtained in this manner.

The package most usually used in Michigan for the currant is the 16-quart case. On account of the nature of the fruit, growing as it does in loose bunches, too much stress cannot be placed upon the necessity of carefully filling and settling the boxes when packing. Otherwise, the cases will arrive on the market with a half-filled appearance. A 16-quart case of currants should weigh at least 21 pounds.

The amount of labor necessary to harvest the crop will readily be realized when it is known that one operator picks only from three to six cases per day.

The Question of Over-Production

The question of over-production is of universal concern among growers of all kinds of fruits. The over-production condition is occurring constantly in some agricultural products with temporarily disastrous results to the producer. It is logical that these over-production periods should occur with all kinds of fruits, and it would seem that once this condition was reached, it must continue for a long time, on account of the comparative permanency of fruit plantations.

However, in actual practice, the duration of the over-production periods are surprisingly short, due undoubtedly to the fact that the grower, either intentionally or through

necessity, neglects an unprofitable undertaking. A little neglect of fruit orchards very materially reduces production, and should this over-production period continue for a few years, this neglect becomes so pronounced as to permanently reduce the producing possibilities of the orchards.

With the currant, any considerable neglect means practical annihilation of the plantation, as the neglected currant plant cannot be profitably rejuvenated.

Hence we have the reason for the fact that over-production periods of this fruit are very short—usually not more than two years.

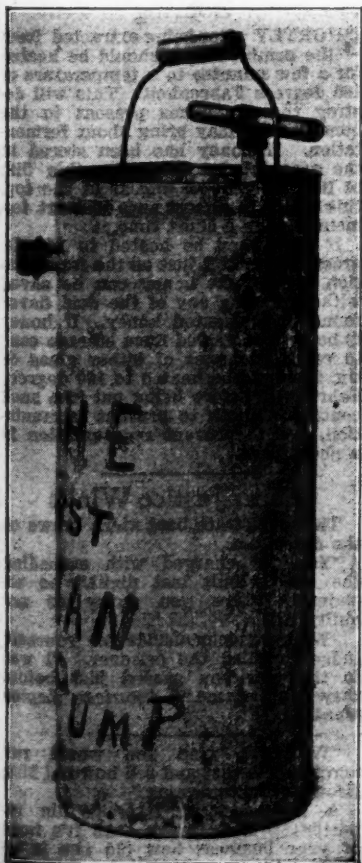
Commercial currant production is very interesting and, with a good location and soil, supplemented with intelligent operation, can be made profitable.

Reader of Fruit Grower Prepares Bulletin on Alabama Agriculture

C. A. SIMPSON, a reader of the AMERICAN FRUIT GROWER MAGAZINE located at Semmes, Ala., is the author of a new bulletin called "Farming Facts" recently published by the Chamber of Commerce, Mobile, Ala. Mr. Simpson was formerly connected with the Department of Agriculture and is therefore well qualified to prepare a publication of this kind. The illustrations are excellent. The material is presented in a convincing, matter-of-fact way. The bulletin is thoroughly trustworthy and does far more justice to the agriculture of that section than bulletins of the spectacular type which have been printed so often in the past. It will undoubtedly exert a good influence among those who read it, and it should prove a real aid in directing public attention to the agricultural possibilities of that promising section of our country.

First Pressure Spray Pump

THE SPRAY PUMP shown below is said to be the first high pressure outfit made for spraying purposes. It was the first pump built by the Bean Spray Pump Company and is now kept in the store rooms of the company at San Jose, Calif., where it is viewed with great interest by many visitors.



The Relation of Root Growth to Top Growth

(Continued from page 11)

havior of this plant seems to indicate that it is adaptable to this country, and the indications are that it may serve as a rootstock on which may be grafted other varieties, and that possibly it may require less water than the roots in use at present. Grape growers in the irrigated districts are learning that the least water that can be used without injurious effects results in producing grapes of the best quality.

From all parts of the earth where conditions are similar to those of the Southwest, explorers and scientists are sending seeds and trees for testing under the keen eyes of observers trained to detect possible economic values. This institution is not established for profit and will not be operated for profit. It is primarily carried on in the interest of scientific research. The institution has been in operation but three years and although some very important facts have been

established, the indications are that still more rapid progress will be made in the future and that the Southwest Arboretum will become one of the best known and most valuable institutions of its kind in existence.

Breeding New Fruit

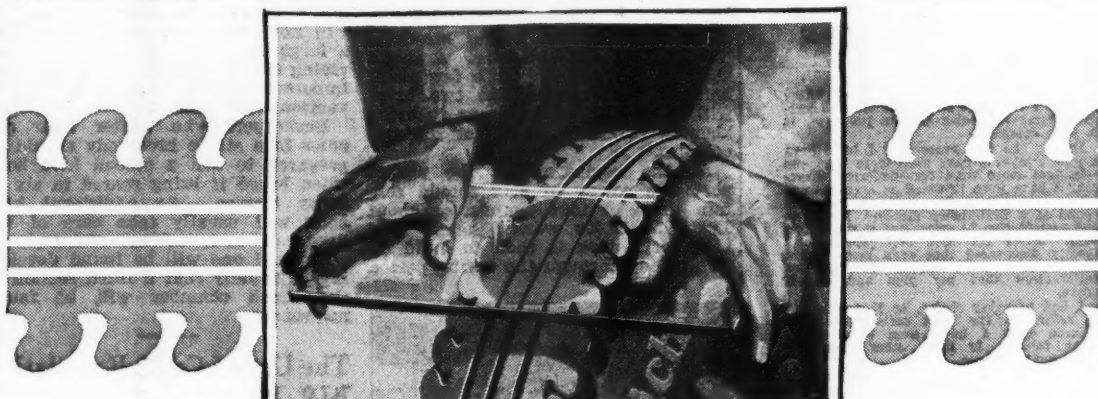
THE METHODS followed at the New York Experiment Station at Geneva in the breeding of new varieties of fruit briefly described in a recent publication of the station which is available free of charge to anyone interested. The pamphlet is well illustrated and the account of the methods used at the station has been prepared by Richard Wellington, associate horticulturist, who has done much of the actual crossing in the station orchards.

"This brief circular has been prepared to answer questions as to how new varieties of fruit are produced, how varieties of the several hardy fruits are crossed, and how seeds and seedlings are handled in the fruit breeding work at this station," says Mr. Wellington. The different steps

in the process of creating a new variety are described and illustrated.

The breeding of new fruits has been one of the important activities of the Geneva station for more than 30 years, it is said, and during that time thousands of seedlings of apples, pears, peaches, plums, cherries, grapes and the various small fruits have been grown on the station grounds. Of the lot, only a very few survive the rigid selection to which the new fruits are subjected.

Before a new variety is named and sent out to fruit growers for further testing, it must demonstrate some striking superiority to existing sorts. It may be earlier or later in season, larger, of better quality or flavor, more resistant to disease, or more winter hardy, or possess some other desirable character. Also, before a variety is finally accepted by fruit growers, it must demonstrate its superiority under various conditions of climate and soil. Already several creations of the station fruit breeders have come into general favor with the fruit industry and are gradually replacing or supplementing older sorts.



The plate glass test—This glass was pressed against a Goodrich Silvertown till the tread flattened as it would flatten against the road. Note how the center grooves can close up, when the tire is under load.

See What Happens when Silvertowns meet country roads

Balloon tires are soft. They yield. Their tread flattens against the road. The center compresses, letting the "shoulders" of the tread come down to the ground.

Simple facts—but what a tremendous effect they have on mileage!

Suppose the center could not yield. Suppose it had bulky masses of rubber where it should be flexible. Then it would crowd the surrounding rubber out of shape. It would distort the shoulder rubber. And uneven, choppy, wasteful wear would be the result.

But Goodrich Silvertowns have the successful

hinge-center tread design. Triple-grooved, easy-flexing center. Massive "shoulders." No crowding. No distortion. No "piling up" of rubber can cause premature wear.

You get the full service which correct design and skillful curing have put into Goodrich Silvertowns.

They are bonded together by Water-Cured rubber—toughened to remarkable uniformity by application of heat from outside and inside both, instead of from outside only.

Added to this extra toughening process, there is the equalized strength of 5,000 stretch-matched cords. Three vital features combine to give you long and carefree mileage.

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Listen in every Wednesday night, Goodrich Radio Hour 9:30 P. M. Eastern Standard Time, over W.E.A.F. and the Red Network.

"BEST IN THE LONG RUN"

Pipe Lover Finally Discovers Tobacco Satisfaction

Tries ten different brands, pays high prices, then finds his favorite at moderate cost

Everlastingly trying brings success, even in finding the right tobacco. Mr. Gaw's experiences prove that. He tried more than ten different brands of smoking tobacco, paid high prices, only to suffer the pangs of dissatisfaction. Finally he concentrated on Edgeworth, and it was then that he achieved true pipe-enjoyment. Read what he says about it:

Philadelphia, Pa.,
Sept. 21, 1927.

Larus & Bro. Co.
Richmond, Va.
Gentlemen:

I write you this complimentary letter because I feel that if any one tobacco company deserves praise for its products, it is your company.

During the two years that I have been a pipe smoker I have used more than one—in fact more than ten—different tobaccos. I have even invested as much as one dollar and twenty-five cents for a half pound of a well-known mixture, trying to find satisfaction in price; but it was all in vain. After the first few pipe-loads I readily discovered that even price and a reputation couldn't supply that bit of satisfaction that my pipe and myself crave.

I had no other choice, so it seems, but to return to the most satisfactory pipe tobacco that I have ever experienced. That tobacco is none other than the Edgeworth tobacco.

Now the pangs of dissatisfaction and grief over exorbitant prices have entirely disappeared since I've concentrated my pipe smoking on Edgeworth.

I am taking this means of thanking you for curing my pipe ills as well as putting my mind at ease now that I have tobacco that satisfies pipe as well as man.

Your ardent well-wisher,
Samuel Gaw.

There seems to be a lot of men who have an unsatisfied smoke-yearning. Some of them try to quell this longing with one new pipe after another. Others, like Mr. Gaw, spend a lot of money on tobacco that simply doesn't hit their taste. They all try many different brands, without success. But those who persevere until they discover Edgeworth seem to be so satisfied that they want to tell the whole wide world about its goodness.



To those who have never tried Edgeworth we make this offer:

Let us send you free samples of Edgeworth so that you may put it to the pipe test. If you like the samples, you'll like Edgeworth wherever and whenever you buy it, for it never changes in quality.

Write your name and address to Larus & Brother Company, 13 S. 21st Street, Richmond, Va.

Edgeworth is sold in various sizes to suit the needs and means of all purchasers. Both Edgeworth Plug Slice and Edgeworth Ready-Rubbed are packed in small, pocket-size packages, in handsome humidor holding a pound, and also in several handy in-between sizes.

On your radio—tune in on WRVA, Richmond, Va.—the Edgeworth station. Wave length 254.1 meters. Frequency 1180 kilocycles.

Fruit Farm Beekeeping

By H. F. WILSON

What to Do for Bees in the Springtime

SUCCESSFUL management of bees means the development of definite plans for giving the bees needed attention at periods when conditions in the hive and in the field demand specific manipulation.

One important part of these plans is to prepare the bees for winter in such a way that the colonies will reach the beginning of the spring period with a maximum strength of bees. If the colonies are of maximum strength at the opening of the spring period, it is not a difficult task to secure strong colonies of bees by the beginning of the honey flow.

All weak colonies containing enough bees to cover at least six frames should be strengthened or united with other less desirable colonies to bring about a maximum spring strength. Uniting is a simple matter. A single sheet of newspaper, with a few small holes, placed between the two hives will be all that is necessary to bring about a successful union of the two colonies.

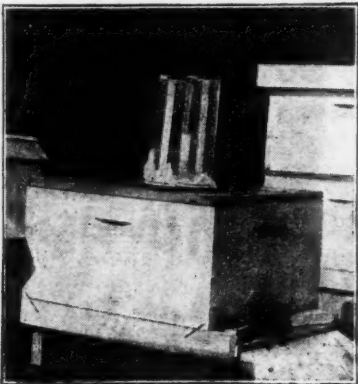
At the beginning of the spring period, a colony of bees should contain three or four pounds, or about 15,000 to 20,000 worker bees. The beekeeper's task is then to build up this colony through the spring period

with some small holes in the cover may be used for this purpose. The pail should be inverted over an opening in a honey board above the frames. The sugar syrup is easily made by combining two pounds of sugar with one of water and heating until the sugar is thoroughly dissolved.

It will also be found advantageous to feed the bees water in the hive in the same way that sugar is given to them. A fair to strong colony of bees will use as much as a pint of water in one day. If this water is available to the bees within the hive, it will save them considerable energy in going to the field and unquestionably will prevent the loss of bees flying out when it is too cold and wintry for them to fly and return to the hive.

If these conditions are provided, and abundant room is given the bees, it will not be difficult for them to rear a large number of young bees. Providing the additional room is the most important step to be taken in the prevention of swarming.

Beekeepers who winter their colonies in a single hive body should be prepared to add a second hive body when brood is being reared in six or seven frames. An additional hive body will usually take care of the needs of each colony, although an occasional one will be found developing so rapidly that a third section to the brood chamber will be found necessary.



Feeding water to bees within the hive during the spring period will prove profitable. The jar at the left contained water, the one at the right sugar syrup. Both were put on full, at the same time. Note that considerably more water than honey has been used, indicating that water, as well as honey, is greatly needed during brood-rearing.

so that it will contain from 75,000 to 100,000 bees when the honey flow is ready. With a colony of this strength, it is possible to gather a maximum honey crop.

Provide Bees with Sufficient Stores of Pollen and Nectar

During this building-up process the bees must have nectar or honey, pollen and water. The beekeeper's first duty, then, is to examine each colony as soon as possible, after they are taken out of winter quarters, and if they do not have sufficient stores of pollen and nectar, these stores must be provided in sufficient quantities for the bees to have a surplus at all times. If the spring weather is warm so that the bees can go into the field, they will probably be able to gather sufficient amounts of pollen. On the other hand, if the weather is cold, or pollen is not available, then the beekeepers should save frames of pollen from one year to the next, and give this pollen during the time when the bees may not be able to collect it in the field.

If frames of honey are not available, the beekeeper must resort to feeding sugar syrup. A honey pail

The Use of Comb Foundation

NO DISCOVERY has been more important to the beekeeping industry than that of comb foundation. The movable frame hive and comb foundation have been the most important factors in the rapid development of beekeeping and they have made it possible for investigators to make detailed studies on the life and habits of bees. Without these two items, it would have been impossible to have made much progress in the study of the bee colony inside the hive, and it would be impossible to produce such enormous crops of honey as are today secured in some sections of America.

It is possible to use too little foundation but not possible to use too much, either in securing satisfactory combs in the frames, or for comb honey. The beekeeper has no tool that he can use to better advantage than comb foundation. Do not skimp in its use. Use full sheets for your frames, and in the comb honey sections use pieces extending from the top to the bottom.

Many of our beekeepers still think that it is possible to use small sections of foundation, both in frames and in sections. But this practice is being rapidly discontinued because it has been found that in a great majority of the cases, poor combs were built in the frames, and large quantities of drone comb are almost sure to be the result. In no other way is it possible to secure combs that do not sag and that extend from the top to the bottom of the frame. Frequently, small pieces in sections drop out or become twisted and result in criss-cross sections or uneven sections poorly built out and not suitable for sale.

Beekeeping as a Business Venture

THERE is plenty of evidence to show that beekeeping can be made a successful business, for there are many persons, both men and women, in the United States, who have made beekeeping a successful enterprise. However, only a few of the many who have started in the beekeeping business have been able to develop it on

a large scale. This is no fault of the beekeeping industry, but may be laid to the fact that those who entered the business did not have the ability to make beekeeping a success.

Therefore, those who are planning to go into beekeeping on a large scale should first start out in a moderate way and prove to themselves that they can make a success with a few colonies. They may then increase their holdings as their capital permits, keeping in mind always that the bees must not be only a hobby, but that they must bring in a profit adequate to the investment and the time spent in the care of them.

Many thousands of beekeepers have from three or four to several hundred colonies of bees which they run either for pleasure or as a side line to whatever business they may be following. Anyone who is keeping bees for fun should have not more than a dozen colonies, for that is about all that he will find time to care for. Any number greater than that will soon become a burden and are bound to be neglected.

With from 50 to 100 or more colonies, one must care for them in the same business-like way that he would handle any other business, if a satisfactory profit is to be secured.

Fruit growers will find it profitable to keep a few colonies of bees, even though they do not plan to get a honey crop. However, without sufficient attention to keep the colonies strong and free from disease, the entire lot may soon die out, and if the fruit grower has secured the bees to pollinate the fruit in his orchard or vineyard, the results will be unsatisfactory, and the investment will become a total loss. The care required to keep bees in fair shape for pollinating fruit is not necessarily great, but the orchardist must give his bees regular attention in the spring and fall to have a large number of bees during the blooming period.

In the final summary, then, unless one is prepared to take care of bees in a business-like manner for the purpose of securing a possible return, either in honey or bees for pollinating fruit, it is better to leave them entirely alone rather than to waste time and energy in making a poor attempt.

How to Prevent Honey from Souring

SHORTLY after being extracted from the combs, honey should be heated for a few minutes to a temperature of 160 degrees Fahrenheit. This will destroy the organisms present in the honey which may bring about fermentation. If honey has been stored in the granulated form and a thin film of liquid begins to appear at the top, this honey is almost sure to start fermentation in a short time.

If honey can be heated to 160 degrees Fahrenheit just as the fermentation begins, the honey can be saved without having any of the acid flavor found in fermented honey. If honey is being transferred from storage cans to retail packages of either glass or tin, it should be heated to 160 degrees Fahrenheit before being put into such containers, both to prevent fermentation, and to prevent regranulation in a short time.

When Justice Winks

The magistrate bent stern brows on the defendant.

"You are charged with exceeding the speed limit last night," he exclaimed. "Are you guilty or not guilty?"

"Well, you can decide for yourself, judge," replied the prisoner. "I was in that car you passed just before they pinched me."—*American Legion Monthly.*

"Willie, I wish you would run across the street and see how old Mrs. Brown is this morning."

A few minutes later Willie reported: "Mrs. Brown says it's none of your business how old she is."—*Boys' Life.*

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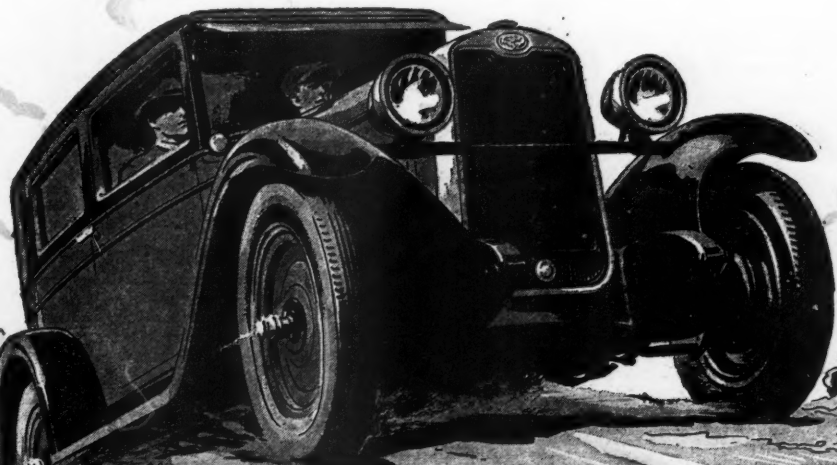
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It's just common sense

To HAVE a good flashlight handy around the farm, I mean. It's so convenient for doing chores in the dark—getting down feed, hunting up a lost tool, and in a dozen other ways. I figure, too, that it's the best fire insurance I can carry. Mine's an Eveready, always loaded with genuine Eveready Batteries.

I favor Eveready Batteries from experience. They're longer-lasting, brighter-burning. Those little Eveready cells produce more light and keep at it longer than you'd ever guess a battery could. They're filled to the skin with the stuff that makes light.

I've got the flashlight habit—and I tell you it's a good one for the farmer.

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Protection for Family Garden and Orchard

By H. A. CARDINELL and J. B. EDMOND,

Michigan State College.

IT IS NOT the purpose of this article to discuss the protection of the plant life surrounding the city and country estate. Such holdings can make use of specialized equipment and experienced gardeners. The grounds adjacent to the farm home and the city or urban home are seldom given protection against diseases and insects. Because of the ravages of such pests, the spirea is stunted by the attacks of green lice, the rose bushes become dwarfed from mildew and aphids, the fruit on the plum tree begins to spoil prematurely as the result of "brown rot," a fungous disease, and the night working cut worms mysteriously mow down the garden plants. How helpless the owner feels against these and many other pests that await the arrival of seed and leaf. The object of this treatise is to show the readers of the AMERICAN FRUIT GROWER MAGAZINE that there are simple ways of holding in check the most serious pests of plant life about the home.

Many farm and town dwellers have already learned to protect their plantings by means of materials placed in water and forced onto the plants by a water pump. As long as the owner of a liquid spray pump has learned the complicated formulas and weights and measures essential for the preparation of small doses, there is no reason to change to the method of applying the dry ingredients by means of a dusting machine, which the writers are now going to suggest.

Three Packages and a Gun

Fruits: Before next May, it is well to purchase a package of sulphur mixed with lead arsenate, known to the trade as "90-10" dusting mixture (90 parts of fine sulphur and 10 parts of powdered lead arsenate). The contents of this package should be used every two weeks from the time the buds open until the middle of August on apples, pears, peaches, plums, cherries, apricots and the ornamentals about the home and grounds. This material seldom disfigures buildings and walks.

Vegetables: At the same time, purchase a bag of dust containing copper-lime-arsenate of lead, known to the trade as monohydrated copper sulphate and lead arsenate (20 parts monohydrated copper sulphate, 15 parts powdered lead arsenate and 65 parts hydrated lime) and apply three or four times at two-week intervals from the time growth starts until

growth is maturing and dry weather prevails. Use on grapes, currants, gooseberries, raspberries and all garden crops.

All plants: The third package should be an air-tight container of a two per cent nicotine sulphate dust (not ground tobacco dust). This material should be used only when green lice are appearing on tips and buds of any plants. A light application on a calm, warm day will kill all struck by the material.

Simple? Yes, and effective; and very gratifying will be the results. Treating plants with dry ingredients is comparatively new and has not always been successful for the specialized commercial producer who after 20 years of practice with chemicals in liquid has learned and in turn taught his help how to measure, mix and apply liquid sprays. Twenty years of practice with dusting should bring a like degree of satisfaction for certain purposes. Dusting is as unlike spraying as a zebra is to a goat. Be that as it may, a slight amount of evidence may be encouraging to those who have read this far in this article, as well as to those who are gluttons for evidence. To satisfy the doubts of the writer, a three-year trial was undertaken under Michigan conditions and resulted as follows:

HAND DUSTING MCINTOSH APPLE ORCHARDS

Treatment.	Per cent clean.	Per cent scabby.	Per cent wormy.	Orchard.	No. of apples examined.
Dusted with sulphur and lead.....	96	3	0	Albert Hemming Orchard, Painesville, O.	482
Untreated	24	73	3		604
Dusted with sulphur and lead.....	96	4	0	Robert Danslin, Painesville, O.	652
Untreated	22	77	0		678

HAND DUSTING WEALTHY APPLES

Treatment.	Per cent clean.	Per cent scabby.	Per cent wormy.	Other insect injuries.	No. of apples examined.
Dusted with sulphur and lead.....	82	13	4	1%	1133
Untreated	40	53	6	1%	878

HAND DUSTING WEALTHY APPLES

Treatment.	Per cent clean.	Per cent scabby.	Per cent wormy.	Other insects.	No. of apples examined.
Dusted with sulphur and lead.....	6	92	2	..	1174
Untreated	1	91	9	..	1425

Unquestionably such encouraging results may not happen every year, for the season determines the results of pest control. No one can say that ninety-six per cent absolutely clean fruit as against 22 to 24 per cent where no protection was given was entirely due to luck. The above results occurred during the year 1925.

What Happened in 1926?

The hand dusting method was repeated in three orchards during the next season to assure us it wasn't all a matter of chance.

In this orchard every other row was left untreated, although these odd rows undoubtedly had some protection from the dust particles floating from rows on opposite sides. Eighty-two per cent of a crop absolutely free of insect or disease injury would bring joy to the heart of many large acreage orchardists. (Second Table.)

What Happened in 1927?

We could stop with the evidence thus far presented, but 1927 was a pest year like unto which we have no record. The amateur went down in the same ship that carried the big producer and for the same reason; faulty timing of the first application. Let us examine the log so that we can chart a safer course, for this is too good a lesson to miss and is of interest to all fruit growers. (Third Table.)

What happened is the old, old story that has been with us since the whisk broom and a jar of dish water were the standard spraying equipment. Apple scab fungus appeared completely ahead of our schedule of applications. The result was the entrance of the disease into most fruit buds when they resembled the pussy-willow

bud stage, and frequent rains thereafter made it impossible to hold down the epidemic.

How to Apply Dust

As soon as the buds begin to open, apply dust to all the plant. Each rainy week apply a coverage, or every two weeks if rains have not occurred, until after the blossoms have fallen and every three weeks thereafter until August.

Vegetables should receive a light application of dust as soon as the plants appear, and every two or three weeks until four applications have been made.

Non-Dustable Pests

Certain troubles cannot be prevented by dusting or spraying. Some of these pests are not worth considering in the very small garden, but where more rows of such plants as radish or cabbage are grown, it would be satisfying to prevent maggots by three applications poured about the roots every 10 days. For this purpose, use one ounce of corrosive sublimate to eight gallons of water.

Cutworms and grasshoppers can be prevented from cutting off plants by placing beneath boards a spoonful of poisoned bait made by mixing five pounds bran, one-fourth pound pow-

dered lead arsenate, one pint molasses, juice of one lemon and enough water to make a moist mash. Place this bait after sundown.

The Everygreen Huckleberry

By Carroll D. Bush

GROWING on sandy stretches along the coast of the Pacific Northwest, we have a broad leaved evergreen huckleberry commonly called the evergreen huckleberry. One grower, at least, has started to domesticate it, and it would seem to offer a new fruit for our coast section where most other fruits do not do very well. The soils that it prefers are of little use for other crops.

As a commercial berry, it has everything in its favor. It has a flavor that finds favor with most people. It keeps and ships remarkably well. It is a fine canner and an excellent pie berry. It ripens late; sometimes picking is done as late as Thanksgiving time.

The bush is a vigorous grower, often reaching the height of eight feet in the wild condition. As with all wild plants, there is a great variation in the quantity and quality of its crops. The largest of the berries are about a half inch in diameter, and some of the plants are very heavy bearers. If careful selections are made from the wild plants, the cultivation of the berry should prove profitable. We have often overlooked American fruits of quality and cultivated less valuable varieties from the older countries. The huckleberry would certainly find a wider use than the currant or gooseberry.

Poison Bait for Strawberry Root Weevils

By WILLIAM L. TEUTSCH

Oregon Agricultural College

AN EFFECTIVE control measure for strawberry root weevils, one of the worst enemies to the strawberry industry in the Northwest, has been found. Experiment station results and demonstrations conducted some time ago by county agents in the principal strawberry growing districts prove the practicability and effectiveness of the method. Since 1904, when the weevil made its first appearance in the Puget Sound country, strawberry growers have been experiencing heavy losses from this pest. Seriously infested patches were completely destroyed in from two to three years or else the yield was so reduced as to become unprofitable.

This new method, discovered by M. J. Forsell of Seattle, Wash., a former horticultural inspector, and patented by him, consists of applying a poison bait made of 95 pounds of dried ground apple pulp and five pounds of calcium or magnesium arsenate. The bait is applied in small pinches to the crowns of each strawberry plant at the rate of from 50 to 70 pounds per acre, depending upon whether the field is check rowed or in matted rows.

Since Mr. Forsell's discovery, both the Oregon and Washington experiment stations have been doing a great deal of work on the pest in order to test the efficacy of other baits, to determine the proper time of application, and to ascertain the proper amounts to use.

The Oregon work, conducted by Don C. Mote, experiment station entomologist, and Joseph Wilcox, assistant, resulted in the discovery of three root-weevil species, a small, a medium, and a large weevil. Each species has a similar life history except as to time of changing from the pupal to the beetle or adult stage, and each species is successfully controlled by the method. The adult beetles are dark brown in color, varying from three-sixteenths to five-eighths inch in length. One generation of adult weevils is produced each year. The insect passes the winter as a little white grub from one-fourth to one-half inch in length and with a brown head. They are found in the soil around the roots of the plant upon which they feed. They should not be confused with the crown borer which is three-fourths to one inch long and bores through the crown of the plant. In spring, the grubs pupate and about harvest time appear on the surface of the ground as adult beetles. Thus, for approximately 10 months of their life history they are feeding on the strawberry roots in the soil.

During the first 10 days or two weeks, the beetles feed on the strawberry leaves before they start laying eggs, and it is during this period that the poison bait must be applied. Killing the adult beetle before it starts to lay is essential to successful control.

According to the Oregon investigators, the proper time to apply the bait is when 75 per cent of the weevils are in the adult stage. This can be determined by digging up and examining the weevils in the soil and comparing the number of white pupae found with the adult beetles on the surface. The bait should be applied directly to the crown of every plant, and applications should be made to bramble fruits and other plants found harboring weevils. Where the work was properly done, from 90 to 99 per cent of the adult beetles were killed with a single application.

While the patented commercial bait gave excellent results, a home-made product made according to the following formula, tested by Mote and Wilcox, gave equally good results:

Bran—5 pounds

Molasses—1 pint, or sugar, 1 pound
Calcium arsenate—4 pounds
Water—2 quarts.

With this formula, kills of 93.93 per cent were obtained within seven days after application as compared with 85.33 per cent for the commercial apple pulp bait.

Science has again responded by developing an effective control for a pest that threatened the strawberry industry of the Northwest, after going unchecked for more than 20 years.

Do Overflows Improve the Soil?

THERE are two ways only by which overflowed land may be affected favorably. One is by the deposit of sediment of enriching character, on the

soil, according to Martin Nelson, head of the Department of Agronomy, College of Agriculture, University of Arkansas. The other is the possible absorption by the soil of desirable chemical substances in solution in the flood water.

"The possibility of enrichment of the soil through the absorption of chemical substances from flood water is very remote and not to be considered seriously. In fact, it is well known that the flood waters are not chemically saturated or even heavily charged. For this reason, there can be no appreciable absorption by overflowed soil," he said.

"The probable benefit to the soil from a deposit of sediment on the surface is one that can be determined by farmers in examining their land. If the deposit is of a silty, alluvial character and of appreciable depth, it may safely be assured that it is an actual benefit to the soil. On the other hand, if the deposit consists of a layer of sand, which is the case in some instances, it amounts to a serious damage.

"Invariably the disadvantages arising from overflows more than offset any possible advantage. Often erosion of the soil is serious and amounts to

permanent injury to the land. The filling in of coarse sand is a detriment. The complete saturation of the soil, which drives out all air and stops all natural processes, both chemical and biological, that must take place in every normally productive soil, is a detriment. The bad conditions arising from saturation must be corrected, but require time and involve loss."

Origin of the Sandwich

THE EATING of sandwiches is said to have originated with John Montague, the fourth earl of Sandwich in England. He was such a gambler that his games often ran for 24 hours. Finally, he developed the plan of having his servants serve the meals in the form of sandwiches so that the game would not be delayed. The method became generally popular and the word "sandwich" resulted.

SEMI-DIALOGUE

"Pop, what's a monologue?"

"A monologue is a conversation between husband and wife."

"I thought that was a dialogue."

"No, a dialogue is where two persons are speaking."

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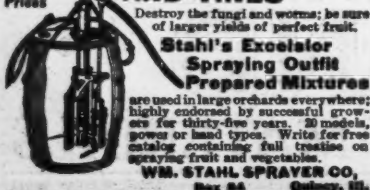
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CHATS with the Fruit Grower's Wife

By HAZEL BURSSELL

Activities for the Month of March

SUCCESS in most things depends on careful planning. Women's activities are no exception to this rule. Since March comes as it does, between the quieter winter period and the intensively active later spring season, it seems to be the ideal time to make complete plans for spring and summer activities. We should make the most of this "planning period."

It is the time to study the seed catalogs and government bulletins on gardening in order to determine the vegetables, fruits and flowers best suited to our particular soils and climatic conditions. Gardens should be laid out on paper, with flowers, etc., arranged according to height, blooming period, color, preference to shade and sunlight, and special soil requirements. Include all old favorites in the list and add, each year, a few new types that sound especially interesting and suitable. Then secure the necessary seeds, and be all prepared to dig in the garden as soon as soil conditions are right. Be sure to plan for plants with different blooming periods, thus insuring a continuous bloom throughout the summer and fall. A garden so planned and executed is bound to be a "success."

Plan Spring Clothes

March, immediately preceding the Easter season, as it does, is the best time to plan the spring and summer wardrobe. The first step is to sort over the garments left from last season to determine which can be used again "as is" after cleaning and pressing, which can be made over into newer and more interesting styles, and which articles must be replaced. List and classify all useful articles in the wardrobe with notations. Then study fashion forecasts and style books to ascertain the salient style points for the season, with special attention to the ideas which may be suitable and becoming to you. Determine the general color scheme, confining the chosen colors to one main neutral color for coats, shoes, gloves, etc., and one or two other becoming and more "interesting" colors for hats, dresses, hose, etc. If possible, go to some of the good department stores or women's apparel shops and study the new garments for ideas.

Finally, make a list of the complete wardrobe with divisions for "Cleaning and Pressing," "Make-Overs," and "Replacements." Include notations with the various garments as to color, style, trim, pattern number, etc. With your wardrobe prepared after such careful planning and study, it cannot fail to be becoming to the wearer, or to have harmony between the various articles in the wardrobe. Remember, however, that it is much more satisfactory and economical to own one costume complete in every detail down to the last accessory than to possess several costumes without the proper accessories for any of them.

Take House Inventory

The annual spring house rejuvenating and house cleaning can and should be planned in this period also. Do not do any actual housecleaning until the weather is settled, so that your hard labor will not be immediately undone. But you can plan and make any needed new curtains, pillows, slip covers or cushions for chairs, etc., before the rush period begins. Then put them in place when the house has been cleaned to your heart's content. Shabby chairs, tables, desks, kitchen furniture or bedroom pieces may be made new and interest-

ing by one or more coats of suitable paint, brushing lacquer or enamel. An inventory of all the furnishings in the home should be taken, articles needing attention should be listed, and the alterations or replacements should be planned. Any of these changes which can be completed before the actual period of housecleaning begins will mean just so much time gained.

Once you've tried the "planning-in-advance-system" you won't want to go back to the "hit-or-miss" way.

Becoming Umbrellas

DO YOU sometimes notice that some of your friends have a tendency to look rather sallow or sick when you meet them on a rainy day? Such is often the case, and if you stop to think, you will remember that they carried a silk umbrella of perhaps a red or green or purple color. They would, more than likely, look very well and have good color if the rain should cease and they could lower their "rain sticks." It would be wise to think about the effect an umbrella is going to have on one's complexion before purchasing.

When buying an umbrella try to select one that will not only go well with your suit, coat, hat, shoes or bag, but will also suit your color. Green umbrellas make the average woman look quite green and ghost-like, while to a chosen few they are most becoming. A young woman with burnished auburn locks and fair complexion should look well under a green parasol. Purple umbrellas cast purple shadows with the result that some persons appear to be suffering from high blood pressure or related diseases. They would have this tendency when carried by a person with considerable color. Avoid unbecoming colors in umbrellas as you do in hats.

The next time you decide to purchase a new silk umbrella, go to the shops, pick out the ones you like and then raise them one at a time before a mirror in good light so that you can see the effect on your complexion. Then buy one that is becoming as well as one that harmonizes with the other garments in your wardrobe.

Family Washing Requires a Long Walk

IN ORDER to determine how much ground a woman covers in doing a family washing, workers of the Department of Agriculture induced a housewife in Ohio to wear a pedometer, which registers the number of steps taken. When a power washer, gasoline iron and running water were available, the washing and ironing were done with four and one-half miles of walking. Without these labor saving devices, the work required from eight to 12 miles of travel.

Desserts from Dried Fruits

AT THIS SEASON of the year fresh fruits are scarce and expensive and the supply of canned fruits is usually greatly depleted after the heavy inroads of winter. Dried fruits fill this gap between winter canned goods and early fresh fruits to excellent advantage. They come in a large variety, including prunes, apricots, dates, figs, raisins and peaches, and may be used with equally good results in almost any type of recipe in which fresh or canned fruits are used. The secret of preparing dried fruits so as to bring out their delicate, natural, individual flavors is to soak them over night in an ample supply of water before attempting to use them in any way. Steaming is an excellent way of cooking them.

Apricot Pie

1 1/2 c apricot pulp 1 egg
1/2 c grated pineapple 1/2 c sugar
1/2 c apricot juice 2 T flour
1/2 c pineapple juice

Soak the apricots overnight in cold water, simmer gently until tender, drain off juice, and put pulp through a fine sieve to secure the needed amount. Drain the juice from a can of grated pineapple. Mix sugar and flour in a saucepan, add boiling fruit juice and cook until thickened. Add this to beaten egg. (If desired, sufficient flour may be added so that the egg will not be needed.) Add fruit. Pour this filling into pie pan lined with unbaked pastry. Cover with top crust or a lattice crust. Bake in hot oven. One tablespoonful of butter may be added to the filling before baking.

Prune Fritters

Dried prunes 1/2 c flour
Walnut meats 1/2 c milk
1 egg 1/2 t salt

Wash and soak selected dried prunes over night, drain, steam until tender. Remove pits and replace with nut meat. Make a thin batter with other ingredients, beating with Dover beater until free from lumps. Dip prunes in batter and fry in deep fat until a golden brown.

Apricot Dainty

1 c cooked apricots 1 c whipped cream
1/2 c powdered sugar 10 lady fingers
1 t pineapple extract 5 Maraschino cherries

Rub the apricots through a coarse sieve, add the sugar and pineapple flavoring, mix well, then fold in the whipped cream carefully. Line sherbet glasses with split lady fingers or narrow strips of sponge cake; fill with the apricot mixture and garnish with the cherries or chopped nuts. Chill before serving. Recipe makes five servings. If preferred, the Dainty may be prepared in a large mold and served at the table by the hostess. Another way of serving the same thing is to prepare the apricot pulp as above, spread it between round or square layers of thin sponge cake, and then top off with whipped cream and cherry or nuts. Leftover plain cake could be utilized in this way.

Prune-Apricot Sauce

1/2 lb. dried apricots 1 orange, juice and
1/2 lb. dried prunes 1/2 c sugar
1 t salt 1/2 c grated rind
1 lemon, juice only

Wash and cover the apricots and prunes with warm water. Soak over night. Add lemon and orange juice and grated rind, and cook the mixture very slowly at sim-

mering temperature until fruit is tender. Remove from fire, add sugar and salt and stir until dissolved. Serve cold for breakfast or as a dessert with or without cream. More sugar may be desired by some families. One-half cup of grated pineapple may be substituted for the lemon and orange in this recipe.

Fig-Peach Marmalade

1/2 lb. dried peaches 1 lemon
1 1/2 lb. dried figs 7 c water
1 orange 4 c sugar

Pour boiling water over peaches, let stand one minute and drain. Add 3 c. water and soak over night. Slip skins from peaches in the morning and return to soaking water. Cut orange and lemon into very thin slices and each slice into sixths. Cover with 2 c. of cold water and soak over night. Wash dried figs in hot water, remove stem ends and cut figs in pieces with scissors. Add to 2 c. water and cook until tender, or about 15 minutes. Put all prepared fruits together and cook slowly until orange rind is clear. Add sugar and boil until thick, stirring constantly. Pour into glasses and seal. Do not cook any longer than necessary as the flavor and color will not be so good. The orange and lemon contain pectin which will thicken the fruit after it cools. This is an excellent relish which can be made in the winter or spring.

Apricot Sundae

1 c apricot pulp 1/2 c sugar
1 t lemon juice 1 c ice cream
Add sugar to apricot pulp and cook until thick like jam. Cool, add lemon juice. Pour 2 T. of mixture over each service of vanilla ice cream and garnish with chopped nuts. Recipe will serve six persons.

Prune Snow Balls

Have as many 5-inch squares of cheesecloth as you have persons to serve. Spread two or three heaping tablespoons of hot cooked rice on each cloth. Place three cooked and pitted dried prunes in the center. Pick up corners of cloth and tie so as to entirely cover the prunes. Drop into boiling water and cook 10 minutes. Remove the bag, serve with sugar and cream or a custard sauce. This is an especially pleasing dish for the youngsters.

Table of Abbreviations

1 t equals 1 teaspoonful
1 T equals 1 tablespoonful
1 c equals 1 cupful
1 lb. equals 1 pound
All Measures Level

Progress in Nut Culture in the North

By JOHN W. HERSHEY

WE FIND the interest in tree crops has not only centered on fruit growing but is rapidly providing the future needs of our nation's stomach along the line of hardy nut trees. Pecan groves have generally been thought to belong to the South, Persian walnuts and almonds to the Pacific Coast, and filberts to the Pacific Northwest. It may be of interest to our readers to know that important strides along lines of improvement have been made in the north. Fifteen years ago such a thing as a variety of black walnut was almost unheard of. Today, we have four good varieties that have thin shells and crack easily, the kernels being gotten out in as much as 80 to 90 per cent whole halves.

These varieties are grafted, of course. They grow rapidly, bear as early as the apple, and have quite an attractive foliage. The pecan, in the latitude of the Ohio River Valley and quite a distance north of it, we find bearing nicely and profitably. Not as large nuts as in the South, but as highly flavored. Some persons claim the northern pecan better flavored and just as thin shelled as the southern nut. They are very ornamental and are hardy north into Canada.

The Persian walnut, commonly called English walnut when grafted on the black walnut stock is doing nicely wherever the peach or sweet cherry does not winter kill. The filbert is one of the best small growing trees one can consider for lawn specimens where small space forbids the planting of larger trees, and for hedges and fillers in a nut grove, as one uses peaches with apples. There is nothing better.

The market conditions convince us that walnut growing in the temperate regions will be one of the most profitable crops in the future. Millions of dollars' worth of nuts are grown and consumed in the United States yearly, and a million dollars' worth imported weekly. The bulk of these are used as desserts, in candy and in confections. The black walnut is in special demand because of its ability to retain its flavor when cooked or baked, and it has a superior flavor in the opinion of many people. Tons of their kernels are now cracked out in homes in the natural walnut belts, but the greatest demand will be when the nice whole halves can be obtained in a continual market. Nice white kernels free of tannic acid which many of the common seedlings have because of allowing the nuts to lay in the hull too long.

One of the speakers at the Easton, Md., convention of the Northern Nut Growers Association, summed up the present situation thus: "Many things that we believed to be true in the past have been proven true, and many of the large plantings that are now only a couple of years old will farther clinch our beliefs when they come into bearing in a few years."

A small planting of 36 trees at Westtown, Pa., bore from 90 to 136 nuts each the fifth year after planting. A planter in southern Illinois, who has over 200 black walnuts and 400 pecans, had nearly a half bushel on a five-year Stabler and 700 nuts nicely matured on a 6-year Thomas. Another man in Lancaster county, Pennsylvania, had over 2 bushels on a 10-year Ohio.

As to pecan performance, 13-year old trees at Rockport, Ind., bore around 80 lbs., and have been bearing since a few years old. These nuts sold for 50c per lb. The black walnuts have been selling, Thomas variety, in Chicago wholesale market for \$5.00 per bushel, while the Westtown people got 20c per lb. for them. Cracked, they retail from \$1.00 to \$1.50 per lb.

Much discussion has been made regarding waste land planting. It is as foolish to plant nut trees on waste

lands and out-of-the-way places as it would be to plant fruit trees there. But for anyone wanting to make an investment, there are a great many abandoned farms in nearly all sections of the country that are fertile and can be obtained at a low cost. Such farms will make fine nut groves with very little care other than cultivation and feeding.

In planting, consider only improved grafted varieties. Seedling nut trees are as worthless for a grove as seedling apple trees for an orchard.

Co-operative Farm Fire Insurance Is Big Business

CO-OPERATIVE insurance associations, more often referred to as mutual insurance companies, are an important element in the field of agricultural co-operation. Information obtained by the United States Department of Agriculture indicates that there are in this country 1950 farmers' mutual fire insurance companies carrying risks that total approximately \$10,000,000,000. This represents about one-half of all the farm property insurable against fire in the United States.

There are in addition about 40 wind-storm insurance companies carrying risks estimated at \$2,000,000,000; also, 30 hail insurance companies and 25 livestock insurance agencies, all of which are farmers' companies operating on a co-operative basis. The volume of risks carried by the hail associations, though large, is not definitely known. Livestock insurance companies are relatively unimportant as measured by the volume of risks carried.

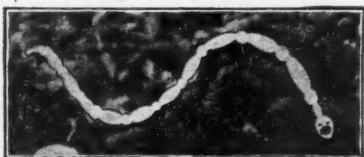
Recently a new type of farmers' mutual insurance company entered the field, namely, the Automobile Insurance Company. Four such organizations are now operating, one of which operates in eight states and is rapidly enlarging its territory. These associations are all located in the Middle West. Insurance written by these companies includes protection against fire, theft, collision, property damage and public liability, or injury to persons.

Better Than a Scarecrow

By R. J. Marran

WHEN the fruit growers in southern Missouri tried a score of methods, without success, to keep the robins, bluejays and squirrels out of their cherry trees, they finally hit upon a nature-faking stunt which has paid them.

Securing from a novelty store a dozen or two of brightly colored artificial snakes, made of jointed wood,



The jointed, brightly-colored wooden snake saves the cherries and berries

the fruit growers, when the fruit is ripening and just before the picking begins, weave these snakes around the branches of their cherry trees in as natural looking positions as possible. Usually one or two snakes to a tree is sufficient. When a bird or squirrel visits a tree to take a nip of the ripe fruit (spoiling more than it eats), it sees these dummy snakes and at once decides to forage in some other tree more congenially inhabited.

Wood's Clover Good Cover Crop for Acid Soils

WOOD'S CLOVER, a native of the Middle West, is believed to be worth trying as a leguminous cover crop in eastern orchards on the strength of its behavior on acid soils in the Hudson River Valley, says H. B. Tukey, associate horticulturist at the experiment station at Geneva, who has been trying out the plant for the past few years. Even on strongly acid soils, Wood's clover has done nearly as well without lime as with it, while on the same soil alfalfa, Hubam and white sweet clover cannot be grown successfully without at least two tons of limestone per acre.

Besides being highly tolerant of acid soils, Wood's clover stands erect and catches snow and leaves for the winter protection of the soil," says Mr. Tukey. "It is killed by frost and therefore presents no serious difficulty in spring cultivation. No livestock

has been induced to touch it in the green condition, hence it is more likely to be left to serve the purpose for which a cover crop is intended. Also, it is a heavy seed producer so that the seed is cheaper than is the case with most legumes.

"With all of these points in its favor, Wood's clover should prove a valuable orchard cover crop, and it is certainly worthy of trial. It appears to be easily smothered out by weeds and does not do well in dense shade. A trial planting should be made in a small way, therefore, until the behavior of the crop in a new location can be determined, for it is as likely to fail as to succeed under new conditions."

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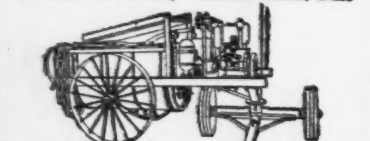
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Fruit Farm Poultry

By RALSTON R. HANNAS

Hatching the Chicks

THE HATCHING of chicks for farm flocks is not so popular as it used to be, since chicks can be bought so easily "ready made" from the hatcheries and breeders. This is a great service to the farmer and relieves him of much of the worry that used to accompany the raising of chicks. However, for those who are interested in hatching their own chicks, the following will be of interest:

Good Breeders Essential

The most important part of hatching is healthy, vigorous breeding stock. The egg and the hen that lays the egg are the cause of at least 75 per cent of all the good or poor hatches. A good incubator and good care during incubation are also of importance, but the eggs and the stock that lays the eggs are the biggest part of the incubation work. Careful attention to the breeders, therefore, must be given if good hatches are to be looked for.

This means feeding them properly besides giving them a comfortable house. Grain must not be the only feed, for too much grain is fattening, and overfat hens will lay eggs that are not so fertile or that do not contain such strong, vigorous germs as the eggs that are laid by hens of normal weight. About 15 pounds of grain per 100 birds per day is plenty. Supplement this with a dry mash, which should be kept before the birds at all times. A mash for breeders should contain no more than 20 per cent protein in the form of either meat scrap or milk. In other words, a good laying ration will do very nicely for the breeders.

Let breeders run out on clear days, and see that they get green food, oyster shell and grit. If your locality is not far enough South to enjoy much sunshine, give cod liver oil in the dry mash at the rate of two pounds of the oil to each 100 pounds of the mash.

Hold eggs intended for hatching no longer than 10 days or two weeks and at a temperature of between 50 and 60 degrees. Turn them once a day during the holding period. Select eggs for the incubator with good firm shells—no pimply ones or thin shelled, irregular shaped eggs, or unusually large or unusually small ones—those that weigh about 24 ounces to the dozen are preferred.

Operation of the Incubator

As to the operation of the incubator, the first and best advice is to follow the directions of the manufacturer, for he has made the machine according to certain principles and knows how it should be run. If there are no directions, or they have been lost, the following will, in general, apply to most of the small incubators:

A temperature of 103 degrees during the entire hatch will give good results. See that the incubator is running properly before the eggs are put in it and that it will maintain this temperature. If desired, the eggs may be put in at a temperature of 102 degrees; it will not take long for the temperature to go to the desired 103. If a machine is used that contains a moisture pan, it is the best plan to fill this pan before the eggs are placed in the machine. See that the pan is kept moist at all times. This is especially desirable if there is a steady flow of air in and out of the incubator; if there is not a constant change of air in the machine, so much moisture may not be needed.

One of the best ways to judge whether or not the eggs need moisture is by the size of the air cell. A rule that is commonly used is as follows: the air cell should be a trifle smaller than the size of a 25-cent piece by the

seventh day, a trifle larger than the size of a 25-cent piece by the fourteenth day, and about the size of a half dollar by the eighteenth day. These measurements refer to the diameter of the air cell. If the air cell is smaller than the dimensions given, add no moisture, but if it is larger, add moisture. The size of the cell must be determined by candling the eggs.

Turn eggs at least twice daily. Eggs may or may not be cooled. They do not need it as far as hatchability goes, for they will hatch just as well with cooling as without it, but a slightly larger chick will be obtained if cooling is done. Therefore, eggs may be cooled "moderately," which means until nearly cold, once a day.

When chicks start to hatch, that is, from the time the first eggs begin to pip, keep the incubator door closed until the hatch is over. Do not open the door for any reason at this time. Also, cover the glass in the door with a cloth to keep the chicks from crowding to the front and trampling each other. When the chicks have completely dried off, they may be removed to the brooder.

Don't Forget Oyster Shells

THIS is the season when the birds are laying their heaviest crop of eggs and they must therefore be provided with the necessary material with which to make egg shells. This material is crushed oyster shells. These crushed oyster shells should be kept before the birds in small hoppers so the hens can eat them as they need them. Grit is also an essential at this time. It acts as teeth for the hens, as it aids in grinding the food in the gizzard. Limestone grit is especially valuable, as the time is of value to the birds in the assimilation of the other feed.

Producers and Reproducers

IT IS always a great feat to produce a hen that will lay a large number of eggs, say 200 or better; a man has cause to be proud of her. Yet he should not let the fact that she has laid this number of eggs get the better of his good judgment. He should be just as cautious in selecting her for a breeder as he would be with a bird that laid considerably less. Egg production is not all.

Aside from the fact that she is of good size and weight and lays a good sized egg—at least 24 ounces to the dozen—she should be a good reproducer. It is difficult, of course, to know whether or not a bird is a good reproducer until she has been tried out. Trapnesting is the only means by which one may find out all about a bird's breeding ability.

A bird may be a good layer but may be unable to produce strong, fertile, hatchable eggs, or strong, husky chicks; in other words, she may not be a good reproducer. Once a hen has been found to be a poor reproducer, she should be removed from the breeding pen. She may be kept with the layers instead. If she does not produce good chicks, it is most unwise to continue breeding from her and to get chicks that will not mature into good pullets or cockerels. Don't breed poor quality or low vitality into the flock by breeding from a poor reproducer, no matter how good a producer of eggs she may be.

Start the Turkeys Early

THE EARLIER TURKEYS can be started, the better. This means saving hatching eggs as soon as the turkey hens start to lay. Many turkeys were late this last year in

developing properly, particularly in the northern part of the country, for the Thanksgiving market.

Hatching turkey eggs with incubators instead of turkey hens or chicken hens is coming into popular favor and good results are being obtained. This means brooding with brooders instead of with hens, also. About 125 poult can be put under one brooder and can be cared for in the same way as baby chicks. The same kind of a feeding system with the same kind of a feed as is used in the brooding of chicks is now used by many turkey raisers with good results.

Many are confining turkeys to yards and alternating these yards, using four yards for a growing period, according to the plan recommended by the Minnesota State Agricultural Experiment Station. The important things in the growing of turkeys are to grow them away from chickens—if they can be grown on ground on which chickens have never run, so much the better—and to feed them well; the old days of allowing turkey hens with their broods to roam the ranges in search of all their feed are gone, for the land is not available to furnish this food. This method has been replaced by the feeding of a good ration regularly, just as the chickens are fed.

Sanitation

DUST and dampness are two of the most important enemies in a poultry house. They must be gotten rid of if proper sanitary conditions are to be maintained. The spores of certain diseases will live for months in dust, but will not grow and develop until this dust becomes damp. The immediate removal of damp litter after a storm will go a long way toward maintaining a dry house, as will ventilation. Ventilation in a poultry house prevents the air from becoming moisture laden by removing the moist air given off by the birds and by taking into the house the fresh air from the outside.

Many people claim that under floor ventilation will aid materially in keeping a house dry. Those that have cement floors may feel that this is impossible with them, but it can be obtained by punching holes in two sides of the cement foundation. A hole about four inches square in each end of the foundation will help considerably if there is trouble with ventilation and with damp floors. These holes should have wire cloth over them to keep out rats or other small animals from beneath the floor.

Disinfecting a house without first cleaning it thoroughly will do very little good. Imagine trying to disinfect a pail containing mud without first having removed the mud. The same thing holds true for poultry houses: the disinfectant will have a better chance to act and will be more effective if the dirt is first removed. This means cleaning the house thoroughly before applying disinfectant. If a disinfecting solution is kept in the drinking water, as some do, this should be strengthened when disease is present. Dust and dampness, however, are the important things to watch in maintaining proper sanitary conditions.

Test the Lights

WHEN electric lights are used in the laying house to increase egg production, it is a good plan to turn the lights on in the daytime once in a while to make sure that all the bulbs are burning properly. It frequently happens, especially where a time switch is used to turn the lights on in the morning and off again after daylight has come, that lights will burn out and the attendant not know it.

If a bulb burns out and is not replaced for several days, with the result that the pen is in darkness, the birds are apt to go into a molt and egg production will drop. It pays to spend a few minutes occasionally to test the lights.

Simple and Attractive Home-Made Sign

By G. E. HENDRICKSON

ROADSIDE SIGNS have long been used by orchardists to aid in the disposal of surplus fruit to local buyers and tourists, but purchasers are becoming more and more inclined to judge the quality of the goods by the advertising displayed, and the hastily and poorly lettered pine board is being passed up for a more attractive invitation at some other point along the road.

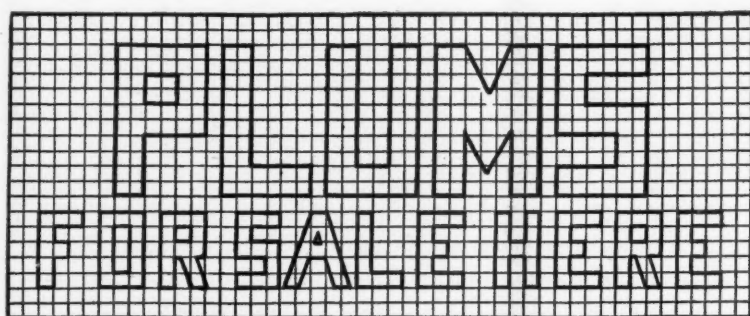
To overcome this loss of patronage, it is not necessary to invest in the services of a high-priced sign writer, as the rawest amateur can produce a very artistic appearing road sign by the simple "block-letter" method here-with described.

Having determined the size of the sign desired, build it of thoroughly dried and seasoned lumber and give it

serve as guides by which they can be easily made. If a more finished product is desired, the sharp corners of the P, U, S, O and R can be rounded.

The letter outlines should then be traced with a sharp knife so that the margins are cut into the board to a depth of at least one-sixteenth inch, and the job is ready to receive the paint.

The white background should be filled in first, taking care not to brush over or across the letter margins, and when this is completed, the black paint can be immediately applied to the letters, as the cut-in margins will safely keep the two colors from flowing together. This simple "trick of the trade" is well worth knowing as it will save much time that would



Lightly pencilled cross lines aid in outlining the letters

a priming coat of thin paint (white lead and oil) on both sides. When the paint is dry, place the blank sign upon a bench, or upon boxes, of a convenient height and employ a ruler and pencil to measure and mark the edges of the top, bottom and sides with short lines spaced one-inch apart. By connecting these with horizontal and vertical pencil lines, as shown in the figure, you have the board ready to map out the lettering, which is accomplished by merely tracing heavily over the lines of the squares, as indicated. In the letters "M" and "A," of course, the angular strokes do not follow the squares but the latter still

otherwise be wasted in waiting for each separate color to dry.

For a temporary sign, the one-coat job will prove sufficient, but, if the sign is to withstand the weather for any great length of time, it will be advisable to repeat the process; and even a third coat, using water-spar varnish, will prove a good investment.

Carefully completed, a block-letter sign of this kind will stand comparison with the majority of out-door sign work and, in fact, its plain and bold-faced lettering will be more productive of results than many of the fancily lettered specimens that are so difficult to read at a distance.

Cheat for Cover Crops

By C. L. BURKHOLDER

Purdue University

RYE HAS long been used as a cover crop in orchard sections. This is no doubt due to the fact that no better substitute has been available, for rye cover crops certainly have their faults as well as their good points. Rye makes an early stocky growth in the spring and unless disked down at just the right time is hard to handle and often proves to be a detriment to the early growth of the trees.

Cheat is classed strictly as a weed, but it makes an excellent ground cover during the winter and in the spring stools out and makes a more grass-like growth than rye. It is much easier to disk in than rye and will grow as well as rye on any soil.

Frank Street, a large Kentucky fruit grower, says: "Last year I used cheat entirely for my winter cover crop. In February, the cheat had stood out much better than rye. At the time I disked it under in the spring, the growth was superior to that of rye and much easier to handle and work into the soil."

A good many Indiana growers are using cheat entirely in preference to rye. Cheat seed is screened from wheat. In localities where wild garlic is prevalent, the garlic seed is screened out with the cheat. Garlic is of no particular menace in the orchard

but is a type of weed no one wants to establish on his farm. This seems to be about the only possible objection to the wider use of cheat for cover crop purposes. Cheat has been sown for pasture in some localities for many years and has never been difficult to eradicate when such fields were sown to other crops.

Chenoweth's Article Is Re-printed in Tasmania

EDITOR, AMERICAN FRUIT GROWER MAGAZINE: I thought you would be interested to know that a large number of inquiries was received following the publication of my article on "Marketing the Culls" in the September issue of the AMERICAN FRUIT GROWER MAGAZINE. One of these comments came from Tasmania. Later I received a copy of the *Hobart Mercury*, a Tasmanian paper, which contained a verbatim reprint of the article published by you. In addition, the editor commented that Australian fruit growers might well consider the possibility of making better use of their cull fruit.—W. W. Chenoweth, Head, Department of Horticultural Manufactures, Massachusetts Agricultural College, Amherst.



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Sales Agents and Fruit Selling Contracts

By LE PAGE ROBERTS

IT MAY BE quite safely asserted that most fruit growers spend too little time in careful consideration of the commission dealer or cash buyer who is to handle their year's fruit crop. If a man who is interested in ships spent a year's labor and considerable cash in building a splendid craft and then put it in charge of an incompetent captain the average fruit grower would join with others in criticizing him. And yet many fruit growers yearly do what amounts to the same thing—they place their crop of fruit in the hands of a sales agent whose financial ability and moral integrity are both questionable. A commission merchant who is honest and whose financial condition is A-1 can offer no serious objection to a careful investigation of his business by a committee of sensible growers who certainly are entitled to sufficient inside facts to justify their confidence in him. Even after a good sales agent is chosen there is the matter of contracts to consider.

There are various agreements, verbal and otherwise, by which a fruit grower and his fruit are annually parted. Usually, however, sales contracts take a form which is a variation of either a cash or a commission deal. Which method has the advantage depends largely upon the men back of the contracts. Any agreement between fruit growers and fruit buyers should be brief and to the point. A grower may safely suspicion any fruit contract which might be mistaken for the back of a railway bill of lading.

There are tricks in all trades and the fruit industry is no exception. In fact there are many fruit growers who are firmly convinced that all the tricks of all businesses originated in the fruit industry. This is probably untrue but there are strong grounds for suspicion when one reflects that the passing of fruit from one hand to another is perhaps the oldest business in the world. It began when Eve handed a grief-laden apple to Adam and he accepted it without a government inspection certificate. Later when he discovered that the apple had a worm in it, he realized that he had no come-back at Eve—she was without either financial resources or personal effects.

From then until now people engaged in the fruit business have needed to keep their eyes open in order to sidestep trouble. The fruit industry likely has no more grief in it than any other but it does have its difficulties, nevertheless. For these troubles the fruit grower oftentimes blames the commission men, the brokers and the railroads, and each of these men or concerns passes the buck back to the grower or to someone else. The grower, however, must admit, if he be absolutely honest in the matter, that a very large share of his grief may rightfully be laid at his own door.

One of the biggest sources of trouble in the whole fruit business is the lax manner in which the grower deals with fruit buyers. Growers will sign contracts that are chock full of loopholes for the crooked dealer to crawl through in case of need. They will sell \$5000 or \$6000 worth of fruit on verbal agreements with no witnesses excepting the commission man's bookkeeper or stenographer. If we delve into the psychology of the matter we can explain it partly on the grounds that the grower takes unusual chances with every crop of fruit which he raises and therefore does not feel afraid to take another chance on selling. By the time a fruit farmer has fought off frost, bugs, and other pests and has seen his crop barely miss being wiped out by hail or excessive rain or drought any selling risks are likely to seem slight in comparison.

Whether a grower should choose a cash buyer or a commission dealer to handle his fruits depends very largely upon the integrity of the dealer. If a man pays spot cash for perishable products he is entitled to a margin of profit for the market risks he takes.

And if a man is dealing on a commission basis he is entitled to his commission, regardless of the sales price of the fruit. Where the trouble usually comes to the grower is on deals that are not what they are represented to be. Such commission deals may be juggled into a cash deal if the profits on the fruit are large or vice versa if the deal falls short of expectations. Many so-called cash deals are not cash at all.

Commission deals vary from a straight commission to a commission with a cash advance and finally a commission with a cash guarantee. This last is what is generally termed a "guarantee plus the raise" proposition, and is all right if the dealer is able (and also willing) to pay the guaranteed price in case of market reverses.

Cash deals include a number of propositions ranging from spot cash at time of delivery to cash after 30 days or some other specified time and some not even specifying at all the time when the money is to be paid. If every grower who sells on a "cash over the scales" proposition would collect his money each day dozens of so-called cash buyers would be put out of business within a year. The reason for this is that many dealers are not cash buyers but are really commission men who set a cash MAXIMUM that the grower is to be paid. They can do this for the reason that many growers who sell to them do not draw out but a fraction of their money at the time of delivery of the fruit. These buyers are really dealing short on the season's business but it doesn't show up on a steady market. In case of a market crash the dealer is wiped off the financial map and has taken the growers' hard-earned money with him.

One reason why many fruit growers will accept almost any kind of a cash offer, however, is because they have been crookedly dealt with by some unscrupulous commission dealer. There are many honest commission men but unfortunately there are some who are not honest. To separate the sheep from the goats without getting hooked in the deal is the fruit growers' problem. If each grower would request a credit statement from the commission dealer's bank he would get a direct line upon the financial resources of the firm he is contemplating dealing with. He should also investigate the character of past dealings which the commission man has had with other growers. A dealer may sometimes have a good financial rating and yet be so crooked he can hide behind a corkscrew. Many dealers would pick up and leave a district without further adieu if they were compelled to undergo a close investigation of their past activities.

One of the steadiest fruit districts in the United States received a severe blow this past season due largely to careless choosing of sales agents by the growers and to a willingness on the growers' part to indulge in a wild orgy of speculation. The manner in which this general fiasco took place is well worth considering. Briefly it was about as follows: (Names substituted.)

I. B. Clever, who is only one of a whole tribe of kindred growers known as "market sharpshooters" and who is mentioned here only for example, went to Lasso and Chokem, cash fruit buyers, and asked them to make a bid on his entire crop. He didn't go to Jones and Smith, old reliable commission merchants, but preferred to do business with dealers who were "not afraid to take a chance." Lasso and Chokem offered him, let us say, \$40 per ton for his fruit. The agreement was rather vague and had it been put into the fewest words possible would have been something like this: "CASH WHEN (and if) THEY RECEIVED IT." The "if" was touched upon very

lightly. Mr. Clever then walked right past the plain offices of Firm and Steady to the pretentious false-fronted building of Hittem and Run, also so-called cash buyers, and informed them that Lasso and Chokem had offered him \$40 per ton for his fruit. Hittem and Run were keen for business and therefore raised the offer to \$42.50. Mr. Clever next proceeded to the warehouse of Crawfish and Dodge who jumped the price to \$45. Feeling convinced that he had "sharpshot" the market Mr. Clever completed his private auction tour by returning to Lasso and Chokem and signing a "sliding" contract for \$47.50. (A sliding contract is one which permits the buyer to slide out in case of need.)

Being exceedingly proud of the deal he had just consummated Mr. Clever then got into his flivver and spent a week or so traveling about the district press-agenting his accomplishment. Fellow growers from all sections flocked to the three firms, Lasso and Chokem, Hittem and Run, and Crawfish and Dodge who were then contracting at \$45 to all comers. When later the first auction sales on the market failed to bring more than half the \$45 which they had agreed to pay to the growers these wildcat buyers made a grand rush to unload their purchases. The result was that the market was ruined—ruined for them and also for Smith and Jones, Firm and Steady and all the other dealers, and Mr. Clever and his sharp-shooter friends took what their wildcat dealers received rather than the \$45 which they had promised. It was that or nothing.

The lesson learned by the growers who lost in this particular deal was this:

IT IS THE PUREST KIND OF FOLLY TO SPEND THE ENTIRE SEASON GROWING A CROP OF FRUIT AND THEN SPEND ONLY FIVE MINUTES SELLING IT. A grower can afford to spend a month if need be in investigating different buyers rather than to sell to the wrong one and lose the profits of his year's labor.

If you are a fruit grower you can well afford to make this your motto: INVESTIGATE FIRST—SIGN UP AFTERWARDS.

It Couldn't Be Done

Somebody said that it couldn't be done. But he with a chuckle replied That "maybe it couldn't," but he'd be one

Who wouldn't say so till he tried. So he buckled right in with a trace of a grin

On his face. If he worried he hid it. He started to sing as he tackled the thing

That couldn't be done, and he did it.

Somebody scoffed: "Oh, you'll never do that;

At least no one ever has done it"; But he took off his coat and he took off his hat,

And the first thing we knew he'd begun it.

With a lift of his chin, and a bit of a grin,

Without any doubting or quiddit, He started to sing as he tackled the thing

That couldn't be done, and he did it.

There are thousands to tell you it can't be done,

There are thousands to prophesy failure;

There are thousands to point out to you one by one

The dangers that wait to assail you. But just buckle in with a bit of a grin,

Just take off your coat and go to it; Just start to sing as you tackle the thing

That "cannot be done," and you'll do it.

—Edgar A. Guest.

Some Practical Examples of Propagation

(Continued from page 4)

In less vigorous varieties, the cuttings are made eight to 10 inches long regardless of number of buds. These cuttings are tied into bundles of 50 to 100 and buried in well-drained soil upside down to a depth of six inches, or in moist sand out of doors. By inverting the cuttings, roots are more likely to start development earlier than otherwise. When growing weather comes, the cuttings should be lined out four to six inches apart in a nursery row. They should be set right side up to a depth that will expose only the top bud.

Gooseberries can be propagated in a similar way, one-year-old wood only being desirable for the purpose.

Blackberries may be readily grown from root cuttings two to three inches in length which are scattered in a trench three to four inches deep and covered with soil. It is highly desirable to grow them in a nursery row one season and then set in the permanent plantation. Blackberries and red raspberries are more commonly reproduced by suckers. These are branches arising from the lateral roots of the parent plant. When mature, they may be dug up, severing the root four to six inches on each side of the shoot, which forms the handle of a mallet, and planted directly in the field.

Propagation by Grafting

Thus far the methods discussed have been those in which the plant grows upon its own roots. The following discussion shall be on the methods of plant propagation in which a plant part grows upon the roots of another plant. These methods are known by the all inclusive term, "graftage." The difficulty or impossibility of getting certain plants to grow from cuttings makes graftage necessary. It is necessary, in order to properly understand the discussion to follow, to know the meaning of certain terms in common use.

The stock is the root upon which the top is grafted. It is in most cases a one-year-old seedling of the same species. It may be a short section of a root, as in piece-root grafts of apples, or it may be the whole root, as in pears and apples, or it may be the root and trunk upon which a top is grafted. Stocks are raised by specialists from seeds shipped from France. The scion is the upper part of the graft and is taken from the variety which the operator desires to propagate. It may be a twig bearing one or more buds, or it may be a single bud and a small portion of bark. In all instances, scion wood must be collected from healthy trees and must be well-matured one-year-old wood. For convenience, graftage has been divided into scion graftage and bud graftage, or budding according to the nature of the scion used. Each has several styles and applications, only a few of which will be discussed here.

Scion Graftage. — Formerly apple and pear were almost wholly propagated by root scion or whip graftage. It was necessary to use the whole root with the pear, making the graft at the crown, but either piece root or whole root succeeds with the apple. In recent years these two fruits have been budded to considerable extent. In piece root grafting of apple, the side roots of the seedling stock are removed and the long straight "ap root" cut into lengths of two and one-half to three inches. At the upper end of each piece, a sloping cut is made with a single cut. A second cut is then made, beginning about one-third the way from the upper end of the slope and at an angle about halfway between that of the slope and parallel with the grain of the stock. The depth of this cut should be about half the length of the slope. Note the second illustration. The same process is repeated on the scion, except that it is accomplished at the butt or lower end.

The scion is then cut six to eight inches long. After these two slopes and tongues have been made, with the right manipulation the stock and scion will slip together and will be interlocked by the tongues. In slipping them together, it is absolutely essential to success to make the cambium layers—the layer of cells just inside the bark—of the two pieces coincide on at least one side. The nearer alike the stock and scion are in size, the greater will be the success of the graft. Firmly wrap the graft union with number 18 or 20 knitting cotton and slip the loose end between stock and scion at one end and break off the thread. Tie the grafts in bunches of 50 and store in fresh hardwood sawdust at a temperature of 40 to 50 degrees Fahrenheit until spring, when the grafts may be lined out six to eight inches apart in a nursery row for one year. They should be set deeply enough that only the top bud is exposed.

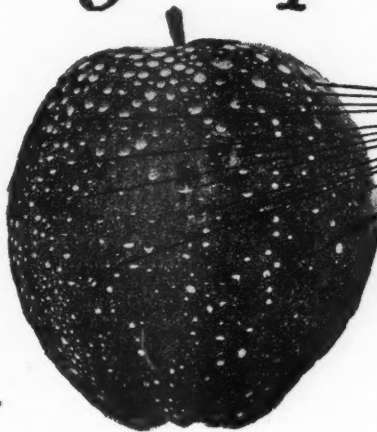
Pear propagation by the whole root method resembles the above except that pear seedlings are used for stocks, the graft is made at the crown, the union must be waxed, and because of the longer root, the scion is made correspondingly shorter.

Budding.—There are probably more peaches budded in America than any other single fruit. In peach propagation, peach pits are planted in rows in late fall in the South or early spring in the North. When the seedlings have reached the size of one-quarter inch in diameter, they are ready to be budded to desirable varieties. In the South, this occurs in June as a rule, while in the northern states, budding is not done until fall. As a result, southern nurserymen can produce a salable peach tree in less than one year, while in the North a one-year-old tree has really been in the soil nearly two years. The bud is inserted in the fall and is not forced out until the following spring.

Budding may be done any time throughout the growing season, provided the bark will slip on both bud-stick and stock. In the South, it becomes necessary to wait until the buds in the scion orchard have sufficiently formed as well as until the stock has become large enough. The stock is prepared for budding two or three days in advance by stripping off the leaves for four to six inches next to the ground. The bud sticks are collected and the leaf petioles clipped to about one-half inch in length. These petioles later serve as handles by which the buds can more easily be inserted. The bud-sticks must be kept moist. With a sharp knife, cut under each bud suitable for use as illustrated. Make a T-shaped incision near the ground through the bark of the seedling stock and gently lift the corners of the loosened bark with the knife blade. Then cut just through the bark above the bud of the bud-stick and lift the bud with a thumb nail and finger tip, leaving the chip of wood behind. Thus the bud is removed with a shield shaped piece of bark from which the method is sometimes named. Quickly force the point of the shield downward under the bark of the stock until the shield is completely hidden and only the bud is seen between the two cut edges of the stock bark. When the bud has been tied securely with twine string, the job is complete, except the cutting of the string on the opposite side of the bud about two weeks later.

In northern nurseries no cutting back of stock is done until the next spring, just before growth starts. At this time the stock is removed to just above the bud, which soon pushes out to take the place of the old top. In the South the bud is forced out almost immediately by cutting back the stock to four to six inches above the bud. Later in the season this, too, is removed.

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Books for Fruit Growers

SYSTEMATIC POMOLOGY

By U. F. Hedrick. An innovation in this book is the introduction of simple keys for the identification of varieties of the tree fruits and the grapes. The keys are especially useful in identifying and comparing varieties. More than half of the book is given over to descriptions of the common commercial varieties of apples, pears, apricots, cherries, peaches, plums, grapes, raspberries, blackberries, currants, gooseberries, cranberries and strawberries.

Cloth, 488 Pages, Ill., \$4.00

A TEXTBOOK OF POM- OLOGY

By J. H. Gourley. General fruit growing practices are outlined, combined with drawings and graphs which summarize the results of experiments. Some of the topics are: composition of fruits; buds of fruit trees; factors influencing bud formation; pruning; thinning of fruit; cultural methods in orchards; fertilizers and manures; relation of climate; winter injury; pollination; origin and improvement of fruit; propagation; storage of fruit.

Cloth, 390 Pages, Ill., \$2.50

THE PRINCIPLES OF FRUIT GROWING

By L. H. Bailey. The present edition is completely revised and includes much new knowledge for the aid of the fruit grower. It considers location and climate, planting, tillage, fertilization, and maintenance of the orchard and berry patch in full detail. Chapters also included on accident and injury, spraying with insecticides or fungicides, harvesting, grading and packing.

Cloth, 482 Pages, Ill., \$2.50

THE NURSERY MANUAL

By L. H. Bailey. Completely rewritten and revised. The book is in two divisions. The first describes propagation by seeds, spores, separation, division, cutting, budding and grafting. The division on nursery practice lists the major diseases and insect pests, describes their injuries and gives control measures. The latter half of the book contains a nursery list of plants, giving propagation and cultivation methods for each.

Cloth, 456 Pages, Ill., \$2.50

A MANUAL OF CULTIVATED PLANTS

By L. H. Bailey. Since this is a manual for the practical agriculturist, the list of plants is limited to the common domestic species of the fruits, grains, vegetables, greenhouse plants, ornamental shrubs and trees, and garden flowers. Nearly 3000 common cultivated varieties are included. Identification is made easy by using fully developed keys referring to physical characteristics—habit of growth, foliage, flowering habit, seed-bearing characteristics, and native habitat.

Cloth, 891 Pages, Ill., \$7.00

THE PRUNING MANUAL

By L. H. Bailey. The author discusses the physical make-up of trees, shrubs, and vines, their habits of growth and modes of flower and fruit bearing. The emphasis of the all-important relation of these factors to pruning if results are to be beneficial, leaves one with a wholesome respect for a knowledge of the skillful use of the saw and shears.

Cloth, 400 Pages, Ill., \$2.50

THE COMMERCIAL APPLE INDUSTRY IN NORTH AMERICA

By J. G. Felger and E. M. Thomson. Advice on selecting a locality and site for a commercial apple orchard is one of the valuable contributions of this book. Commercial apple growing regions in the United States, with advantages and disadvantages of climate, varieties and markets are discussed. All of the phases of successful planting, management and marketing are discussed fully and from a business standpoint.

Cloth, 466 Pages, Ill., \$3.00

BUSH FRUITS

By F. W. Card. This book is divided into four parts. Part 1 gives general consideration to planting, cultivation and harvesting. Part 2 discusses the raspberries—raspberries, blackberries, and dewberries—their planting, maintenance, varieties and their disease and insect pests. Part 3 considers currants and gooseberries in detail. Part 4 discusses blueberries, buffalo berries and other fruits of less general distribution and importance.

Cloth, 411 Pages, Ill., \$2.50

THE PEAR AND ITS CULTURE

By H. B. Tukey. Brings together in compact form the latest and best information about the pear, discussing such subjects as the new pressure test for determining maturity, the bending of shoots to promote fruitfulness, setting of fruit, trend of the industry, pest control, cultivation, pruning, topworking, picking, grading and marketing.

Cloth, 125 Pages, Ill., \$1.25

PEACH GROWING

By H. P. Gould. A book for the commercial peach grower or the man interested in developing a peach orchard. The history and introduction of the peach into the United States and the development and present extent of commercial orchards are treated in detail. Locations and sites for orchards are discussed, also propagation of the land, handling of the trees when received from the nursery, planting and similar operations. Under orchard management are taken up problems such as tillage, cover crops, green manure and alkali control, fertilizers, pruning, control of insects and diseases.

Cloth, 426 Pages, Ill., \$2.50

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BOOK DEPARTMENT

American Fruit Grower Magazine, Chicago, Ill.

MANUAL OF AMERICAN GRAPE GROWING

By U. F. Hedrick. A complete discussion, recently revised, of the history, growth, manufacture and use of grapes. Growers will find it valuable in all the details of cultivation and marketing—propagation, disease-resistant stocks, care and management, fertilizing, pruning, culture under glass, pests, marketing, breeding and variety descriptions.

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THE CULTIVATION OF CITRUS FRUITS

By H. Hazard Hume. Supplies information on botany, history, varieties, propagation, soil, location, planting, cultivation, water supply, frost considerations, pruning, picking, packing and marketing. Describes the insects and diseases which attack the fruits and gives directions for mixing and using sprays, dusts and fumigants in their control.

Cloth, 551 Pages, Ill., \$5.00

CITRUS FRUITS

By J. Elliot Galt. Covers every phase of citrus fruit culture from the standpoint of the grower, with special reference to California conditions. Will answer many problems on history, varieties, planting, propagation, cultivation, fertilization, irrigation, pruning, frost protection, picking, packing, judging, marketing, disease control, insect and pest control.

Cloth, 520 Pages, Ill., \$3.00

MANUAL OF FRUIT DIS- EASES

By Lex R. Heiser. Tells the grower the causes of the diseases he must combat and helps him understand and properly control them. Diseases are described under an alphabetical list of the fruits they attack—apples, apricots, blackberries, cherries, cranberries, currants, gooseberries, grapes, peaches, pears, plums, quinces, raspberries and strawberries. The last chapter gives directions for the preparation of fungicides.

Cloth, 468 Pages, Ill., \$3.50

MANUAL OF FRUIT INSECTS

By M. V. Slingerland and C. E. Crosby. Nearly 200 species of insects which attack the apple, pear, peach, plum, bush fruits, grape and cranberry are named under the fruit which they attack. Identification is assisted by nearly 400 illustrations of the pest at its work or in a distinguishing pose. Life habits are given, injuries are described and control measures are recommended.

Cloth, 503 Pages, Ill., \$3.50

A MANUAL OF SPRAYING

By K. L. Cockerham. A handy pocket-size volume is valuable for both the commercial and casual grower. Tables, classifying plants according to the similarity of insects and diseases attacking them, tell the nature of the injury, treatment and time of application of insecticide or fungicide. Separate chapters are devoted to preparation of the specified sprays and discuss types of sprayers best adapted for varied purposes and conditions.

Cloth, 87 Pages, Ill., \$1.25

THE BOOK OF BULBS

By F. F. Rockwell. Spring, summer and winter flowering bulbs are considered. The chapters on planning and making up gardens, naturalizing bulbs, propagation and protection from insects and diseases are full of practical help.

Cloth, Ill., \$3.00

CITRUS DISEASES AND THEIR CONTROL

By Howard S. Fawcett and H. Atherton Lee. A thorough, authoritative discussion of the present information on citrus diseases occurring in all parts of the world, in four parts. Part 1 covers general considerations; part 2 describes root and trunk diseases and their control; part 3 takes up diseases of branches, twigs and leaves; part 4 discusses fruit diseases.

582 Pages, Ill., \$5.00

LABORATORY MANUAL OF FRUIT AND VEGETABLE PRODUCTS

By A. V. Cruess and A. W. Christie. A reliable guide to the best modern practice in the manufacture, preservation and examination of fruit and vegetable products. Of prime importance to growers, manufacturers, food inspectors and food chemists.

108 Pages, Ill., \$1.50

STRAWBERRY GROWING

By S. W. Fletcher. Strawberry growing and all the attendant factors which lead to profit or loss in the commercial enterprise are considered. Every consideration affecting the crop, from choice of site to the marketing of the ripe berries, is developed from the viewpoint of the practical grower.

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By M. C. Burritt. A book for the average farm in the northeastern states with its small apple orchard. It gives practical information on subjects such as choosing the orchard, planting and growing, pruning, cultivation, cover cropping, fertilizing, insects, diseases, spraying, harvesting, storing, marketing, renovating old orchards, and the cost of growing apples.

Cloth, 177 Pages, \$1.00

BUSH FRUIT PRODUCTION

By E. A. Van Meter. The fruits considered in this book are raspberries, blackberries, dewberries, gooseberries, currants and blueberries. Everything concerning these fruits treated in a convincing and practical manner.

Cloth, 126 Pages, Ill., \$1.25

Books and Bulletins

A Review of New Publications

MANY of our readers are flower lovers and will be interested in two very good books which have recently come to our desk.

One of them, called "The Iris," is written by John C. Wister, president of the American Iris Society and one of the best informed men in the country on this flower. The book is not a large one, containing but 122 pages. However, the author has been able to present in this small space a clear, practical and condensed account of the facts about this plant, including the history, adaptations, botany, varieties, cultural methods, insects and diseases and other important factors. Those interested in this plant will find the book helpful in handling every problem that presents itself.

The other book is entitled "The Gladiolus" and is written by Dr. A. C. Beal, professor of floriculture in Cornell University, Ithaca, N. Y. Dr. Beal's long experience in college and experiment station work has enabled him to become thoroughly familiar with every detail, practical and scientific, concerned in the care and handling of this popular plant. The book contains chapters on botany, types and varieties of gladioli, soils and fertilizers, methods of culture, harvesting and marketing of corms and blooms, breeding and preparation of exhibits. Those interested in gladioli will make no mistake in purchasing a copy of this book.

Both of these books are part of the Farm and Garden Library Series. They can be obtained from the AMERICAN FRUIT GROWER MAGAZINE, 53 West Jackson Boulevard, Chicago, Ill., for \$1.25 each.

THE EXTENSION Service Handbook of Agriculture and Home Economics, under preparation for some time in the United States Department of Agriculture, is now being distributed. Printing, assembling and indexing have been completed for the entire edition. A loose-leaf edition is being sent to county extension agents and members of extension divisions of the State agricultural colleges. A limited edition has also been bound for miscellaneous use, copies of which may be purchased from the Superintendent of Public Documents, Washington, D. C., for \$1.50 each.

Need has long been felt, particularly in agricultural extension work, for a publication which would give in the briefest possible form such results of the research of the department in all lines as are ready for extension. It was deemed essential, also to have the material presented in such form that new facts could be readily added as they became established. To meet this problem, the Association of Land-grant Colleges at its annual meeting in 1923 recommended the publication of a handbook of agricultural facts to be prepared in the Federal Department of Agriculture.

Information has been assembled, to date, in 17 divisions: General, extension, agricultural economics, agricultural engineering, agricultural technology, animal diseases, animal husbandry, dairying, entomology, fertilizers, field crops, forestry, horticulture, plant diseases, soils, weather, and wild life. Material for four more divisions will be distributed later covering economics and management in the home; foods and nutrition; housing, equipment and furnishing; and textiles and clothing. The present form includes 953 pages.

A comprehensive system of indexing is followed which permits the use of any one or more sections as a separate book if desired, as well as covering the entire handbook. Specialists will in this way be able to make up their own handbooks on subjects relating especially to their work.

Loose-leaf additions under subjects on which new material has been developed will be issued during each year, each a unit in itself so that it may be inserted in its proper place. Eventually it is possible that some sections may grow to handbook proportions, themselves. The first of these additions is already prepared and will go forward to the printer at once. It relates to range management and will include information available on the economic, animal husbandry, forestry and soils phases of this subject. These new sheets will be sent to all holders of loose-leaf editions.

A NEW bulletin entitled "Fertilization of Apple Orchards (2)" has just been issued by the Agricultural Experiment Station of Morgantown, W. Va. The authors are M. J. Dorsey and H. A. Knowlton. The bulletin describes experiments which have been in progress for many years at the station.

Points in Apple Aphid Control

AN APPLICATION of nicotine sulphate spray made after the fruit buds have opened and when the tips of the leaves extend one-fourth to one-half inch is a good insurance against severe losses from apple aphids, according to P. J. Parrott, entomologist at the New York Experiment Station, in commenting on profitable spray practices for New York.

Repeated observations of aphids on apple trees in the orchards of the state show that most of the aphid eggs have hatched when the apple buds have reached the stage of development indicated. It is against the newly hatched insects that the nicotine spray is most effective, says Mr. Parrott.

The spray formula used in the station orchards and found to be entirely satisfactory contains two and one-half gallons of lime-sulphur, one pint of 40 per cent nicotine sulphate, and two and one-half pounds of lead arsenate in 100 gallons of water. This spray should be applied under a pressure of at least 200 pounds and should cover the underside of the twigs and small branches to give the best results, it is said.

A few essential points to watch in spraying for apple aphids are listed by Mr. Parrott as follows: "Do not spray when the buds are wet with dew or during showery weather. Select as far as possible days for spray operations when the air is balmy and little or no wind is stirring. High winds cause waste of materials and make thorough treatment difficult. High temperatures accelerate the volatilization of the nicotine."

"Apply mixtures under high pressure, using a fairly coarse and driving spray. Remove all watersprouts and suckers during early spring. The rosy aphid and the green apple aphid are partial to them and they often constitute centers of infestation, particularly for the green aphid."

"Judicious pruning of trees to remove excess wood not only makes for greater productiveness and better color of apples, but it also helps to simplify the work of spraying. With open-headed trees rains and wind have a better chance to remove many aphids."

Sounds Reasonable

A pedestrian fell into a coal hole and called for help. "Dear me," said a gentleman, coming along, "have you fallen through that coal hole?" "Not at all," replied the man. "As you seem interested, I will say that I just happened to be in here and they built the pavement around me."

Culture, Cover Crops or Mulch?

(Continued from page 7)

over those trees remaining in sod without nitrogen.

There was no apparent increase in growth or production, however, on Grimes trees in cultivation or straw mulch as a result of similar applications of nitrogen. All varieties grown under cultivation and cover crop or continuous straw mulch showed no significant increase in total yield from these nitrogen applications, but the set of fruit may have been increased in some seasons.

Nitrates Low on Sod Plot

Soil analysis showed the nitrates to be much lower under sod in early spring than under cultivation or straw mulch. It was also apparent that when a nitrogenous fertilizer was applied to a portion of the trees in each plot, the nitrates in the soil of the sod plots disappeared much more rapidly than did the nitrates in the cultivated or straw mulch plots.

These studies showed that whenever grass alone was used, growth and production were less than where a heavy mulch of straw was placed about the trees or where a system of cultivation and cover crops was followed. The lack of available nitrates for tree growth is an important factor contributing to the poor growth and production of trees in sod.

This lack of nitrogen is manifest in the general type of growth of trees grown in sod without nitrogen. The amount of annual twig growth and increase in trunk circumference is small; the set of fruit is light and the total production is low. The color of the foliage of the trees grown in the sod also is poor, being a light yellowish shade during the growing season, frequently greatly reduced in amount, and dropping very early. Trees in cultivation or straw mulch produce a heavy, dark green foliage that hangs upon the tree until after heavy frost.

The trees that have been continuously grown under straw mulch have been as productive over the entire period as trees receiving cultivation and cover crops. A sufficient supply of available nitrates appears to be present under a heavy straw mulch. Moisture conditions are also favorable for growth, as the soil is always damp beneath the mulch. The rate of growth and production in the mulched plot has been more uniform and constant, with less yearly fluctuation than is the case on the cultivated plot.

Throughout these investigations,

the available supply of nitrates has appeared to be the most important factor limiting growth and production. The value of sufficient moisture throughout the growing season, especially in the case of young trees just becoming established, was also shown to have a bearing on their behavior. Lack of moisture may also limit the size of the fruit on bearing trees.

Grass and weeds transpire large quantities of water and utilize a large portion of the supply of available nitrogen; consequently any efficient method of orchard soil management must either eliminate grass and weeds or supply nitrogen over and above their needs in order that nitrates may be available for the trees. Cultivation prevents the growth of grass and weeds; a heavy mulch of straw beneath the tree smothers them where they compete most with the tree roots. The heavy evaporation directly from the soil is also checked by either the cultivation or straw mulch system.

Under the conditions prevailing in this orchard the straw mulch plot has been a little more costly to maintain than has the cultivated plot. This was due principally to the high cost of the straw in the locality and the difficulty of securing it nearby.

During these studies, an attempt was made to grow grass between the tree rows in a sufficient quantity to form an adequate mulch when cut, dried and placed about the trees. An application of 10 pounds of nitrate of soda and 10 pounds of acid phosphate was broadcast over the square between each four trees to increase the growth of grass. A large increase in grass and weeds resulted, being about three times the amount produced without fertilization. The total amount of air dry mulching material, however, seldom exceeded 100 pounds per tree square, which was only about one-half the amount of straw necessary to add annually to each tree to provide an adequate mulch for the average 12 to 15-year-old tree.

To be of maximum value, the mulch must be sufficiently heavy to entirely prevent grass or weed growth and to protect the soil from drying out.

Note.—The complete report of these investigations has recently been published as Bulletin 315 by the Purdue Agricultural Experiment Station, Lafayette, Ind. Copies of the bulletin may be secured by those interested in a detailed report of this work.

Can the Prune Situation Be Improved?

(Continued from page 8)

tage would be a reasonable increase of per capita consumption through consistent advertising campaigns backed by standardized and careful packing.

Requirements for Better Distribution

At the request of the prune growers in the Northwest, the Bureau of Agricultural Economics about a year ago made a study of the marketing of the Italian prune, and many of the facts developed are of equal interest to producers of Petite prunes as well. In connection with the northwestern prunes, a study of eastern markets indicated that the first requirement of improved distribution is establishment of complete confidence on the part of wholesale and retail distributors in the quality of Italian prunes, which has been very variable in past years. Establishment of adequate standards and inspection systems also needed probably will be brought about only by grower co-operation. Compilation of experiences in eastern markets also brings out that a steady supply of satisfactory product is a requirement. In the course of this study, 700 retail stores were visited, of which 25

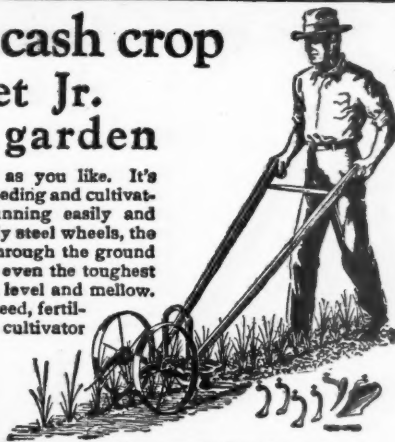
per cent were chain stores. It was found that retailers had no particular preferences and usually knew little about brands. It was found that the majority of sales to them were one-pound and two-pound lots. In 15 per cent of the stores, attention was directed toward prunes by specially prepared placards. In replying to the question as to how prunes were labeled or designated, one-half the store managers indicated that they were referred to simply as prunes. About one-third used the designation of California for Petites and Oregon for Italian, and a few used the terms "sweet" and "tart." Sixty per cent of the retailers believed consumption would be stimulated by display advertising and sales service work.

Time to Fly

"Do angels have wings, mummy?"
"Yes, darling."
"Can they fly?"
"Yes, dear."
"Then when is nurse going to fly, 'cause daddy called her an angel last night."
"Tomorrow, darling."

Your best cash crop —a Planet Jr. hand tool garden

HAVE as big a garden as you like. It's child's play planting, weeding and cultivating it with a Planet Jr. Running easily and evenly behind light but sturdy steel wheels, the tempered sharp hoes shear through the ground close to the row, snaking out even the toughest weeds, leaving the soil loose, level and mellow. The plows open furrows for seed, fertilizer, etc., and close them. The cultivator teeth break up crust and loosen the soil to the proper depth for best results. The first cost is practically the last, too.



Planet Jr.

Have you the Planet Jr. catalog? Or our free garden handbook, "Home Gardens—How to Grow What You Eat"? Ask your dealer or write us today.
S. L. ALLEN & CO., Inc.
Dept. 26-C 5th & Glenwood Ave.
Philadelphia



The Everlasting STRAWBERRY

Bears 2 Full Crops Yearly
Spring and Fall. Great yields of big beautiful berries. Write for FREE Catalog of Berry Plants, Trees, Shrubs, Vines, Perennials, etc.
L. J. FARMER, Box 242, Palisli, N. Y.
"The Strawberry Men for 45 Years"

STANDARD GARDEN TRACTOR

A Powerful Tractor for Small Farms, Gardeners, Florists, Nurseries, Fruit Growers and Poultrymen.
DOES A MEN'S WORK
Walking & Riding Equipment
Free Catalog Runs Belt Jobs
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3218 Como Ave. Minneapolis, Minn.

When you buy Nitrogen

ask your fertilizer dealer
these three questions—

1. What is the mechanical condition—is the fertilizer well-pulverized, and ready for immediate use?
2. Is it readily available for plant use after application?
3. Will it leach out under heavy rains?

ARCADIAN Sulphate of Ammonia scores on every count!

It is fine and dry, easy to apply, quickly available, non-leaching—and low in cost per unit of nitrogen. (Arcadian Sulphate of Ammonia contains 25 1/4% ammonia, 20 3/4% nitrogen, guaranteed.) These are features which have rapidly brought Sulphate of Ammonia to a position of leadership throughout the world.

NOTE: See your dealer now regarding your requirements for this season. Remember there was a serious shortage of Sulphate last year. Place your order now. We'll send you a free sample—just mail the coupon.

Results PROVE the quick availability of the nitrogen in

ARCADIAN Sulphate of Ammonia

The Barrett Company
Agricultural Dept.
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Atlanta, Ga.
Medina, O.
Montgomery, Ala.
Memphis, Tenn.
Shreveport, La.
San Antonio, Tex.
Raleigh, N. C.
Washington, D. C.
San Francisco, Cal.
In Canada
Toronto, Ont.

Free Sample

We'll send you—FREE—enough Arcadian Sulphate of Ammonia to fertilize 25 sq. ft. of soil. We will also send you free bulletins by leading authorities telling how best to use Arcadian. Just fill in the coupon and mail it—today!

The Barrett Company (address nearest office)

Please send me sample package of Arcadian Sulphate of Ammonia. I am especially interested in.....

(Write names of crops on line above)

and wish you to send me bulletins on these subjects.

Name.....

Address.....

G-3-28

Charming Homes at Low Cost

HERE a little and there a little must perforce be the method of most orchard home-makers. We haven't the means to "do over" the entire house at any one time. We try to avoid depletion of our none too portly pocketbooks, by filching from them the price of a new chair this month and postponing fresh curtains for the living room until another time.

Our rooms are like the old woman's apron—never entirely new. Just a top added to the old bottom in the spring and a bottom to the old top in the fall.

In this way we can always feel quite at home in our surroundings, while those who are not compelled to count the cost, frequently change all draperies, upstairs and down, at one clean sweep, discard old furniture for new, transform entire interiors and rip out the very vitals of the house every so often. We doubt if they can find the way about their own homes in the dark.

Keeping Home Up to Date

Yet every woman who loves her dear home wants to keep it up to date, just as she wishes her own dress to be, if not of the same quality, at least of the same cut as "what they are wearing in Paris." The stores and catalogs are kind in furthering these ambitions. Each girl and woman in the rural districts can learn the latest decree of fashion abroad the week after it sails past the Statue of Liberty on the way to New York.

Newest things for the home are displayed in many stores at a reasonable price. If you are sufficiently strong minded, it may be a good plan to take a purely sight-seeing trip to the very best stores and view the very best things. Having resisted the temptation to indulge, even in regrets, go cheerfully elsewhere to select what most nearly approaches the perfect thing you have seen.

Inexpensive copies are sometimes excellent. The day has long gone by when only the wealthy could lay any claim to good taste. Flimsy fabrics of harsh colors held no lure for the artistic home-maker of slender means. Reasonably priced furniture was clumsy and poorly finished.

Now, how truly charming are some of the offerings with which we may increase the attractiveness of our homes without exceeding our budgets. We've learned to avoid the cheaply garish and make only such selections as are in keeping with a home of modest elegance.

See what has taken the place of the hideous chromos which not infrequently hung upon the walls of country and city homes alike. There's nothing prohibitive now in the price of many good and simple pictures which do not pretend to be anything but what they are.

A striking wood cut, an etching, a finely colored print may be picked up at odd times. It is no longer thought tolerable to plaster the walls all over with a heterogeneous mass of frames of every shape, size and material, containing as varied a conglomeration of pictures.

We've even gone beyond imagining that, because a picture is good in itself, it must necessarily be right anywhere. It is not. Whatever is hung on the walls must accord with the general scheme of decoration, must be a part of a considered whole. In the proper setting, even the bright textiles, woven for the purpose and now so much in use, are entirely acceptable as wall ornament.

The Choice of Linens

And then there's table linen. Though the exquisite weaves of damask still exercise a potent charm, there is much real decorative quality in the lower grades. It's welcome to many, for one is no longer bound down to the pure white linen which still holds first place for a formal dinner. At breakfast and luncheon particularly, our sincere liking for color may be freely indulged.

The Orchard Home

By MARY LEE ADAMS

There's the delicate blue napery, so soft and serene; the lavender, simply crying for a fragrant centerpiece of violets; the rosy cloth, which would cheer the most forlorn foggy morning breakfast.

I'm waiting eagerly to try one of those lovely pale primrose yellow sets for luncheon. Maybe there will be a chance to do this before long for, near my orchard home, the daffodils venture out even in March, and anyone can see that daffodils, with their fresh and bending green blades and golden trumpets, are the most joyous flower choice for such a table.

It is impossible to decide whether the guests would most admire with this the old white and gold china (a trifle chipped) or whether the opportunity is favorable for trying the set of clear green glass with which my Christmas stocking bulged on December 25 last. These complete sets of dishes, plates, every vessel for food or drink, in the loveliest shades of colored glass, are a novel delight.

New Lighting Effects

The electrically lighted home may now procure one or more of the recent designs for lamps. Some tiny ones of glass are appropriate for making a welcome spot of color in a dim corner. Graceful figurines in porcelain, metal and glass, are among the very inviting but not very cheap attractions.

Geometric designs are favored for the decoration of "modernistic" houses. Pictures of such apartments leave us cold and somewhat confused. Until we've actually seen one, we cannot say whether the illustrations do them an injustice. Are the walls really all slanting at different angles, threatening instant collapse, and do the chairs, on investigation,

prove the apparent impossibility of maintaining a seat upon them?

But lighting fixtures for every taste abound, even comic ones. Since there is nothing so tiresome as a fixed joke, it were better to avoid, unless in the nursery, such fancies as a dog gnawing a lighted bone, or a snail with illuminated shell on his back.

One of the inexpensive ways to add to the attraction of a bedroom, is to dress the bed with a hand-made spread. Home dyeing is often successfully used to carry out the color scheme of a bedroom. If the work on the spread is to be of the candlewick type, the material used may be simply unbleached "domestic." The decorative design is not beyond the power of very moderate skill to carry out.

Very pretty rayon coverlets in every shade are inexpensive and most effective. Having dressed the beds, you may aspire to deck your bedroom or living room floor with hooked rugs. These are now in good style and may be had for little more than the time and ability required to make them.

There's an intimate charm in a crisply curtained, harmoniously furnished bedroom, that takes the heart and makes even the stranger feel at home. It is indeed the homiest place in the house. It breathes of peace and comfort.

Let the pictures you select for your own room be in keeping with the effect you wish to produce. Simply framed colored prints may be just the thing. I saw some of the dearest flower pieces of this type recently. As for some of the colored French prints, they are really very beautiful and by no means beyond a slender purse.

THE 1928 BABY

THERE are thousands upon thousands of babies on the way just now. What has the baby a right to expect? "A Welcome," you may say. Unless circumstances are exceptional, he is fairly sure to get a warm one. That his mother has been willing to bear him, is proof of her eagerness to own the tiny being. An unwelcome child is one of the most pathetic events in nature.

But baby needs more than a welcome. Before this can be extended to him in person, his mother should busy herself about assuring the perfection of his debut into the world. This does not mean she should wear herself out fashioning exquisite, wee garments, but she should be occupied in fitting herself to be the very healthiest mother she can possibly provide for her baby.

"Remember," says our Children's Bureau, "Simple, regular, normal living during this period makes for good health in both mother and baby." While this is absolutely true, the mother should recognize that—just in case there should be some (perhaps merely temporary) derangement of her health which might militate against the well-being of herself and child—she should by all means consult a responsible doctor, one who will give her regular care and advice until the little one lies safely blinking at the light of day.

And if baby has cause to bless the mother whose *go-to-it* courage and care have already, at its birth, meant so much to him, how much more will he bless, all the days of his life, the mother whose *stick-to-it* care, and patience and wisdom shall guide his tottering steps aright on the road to health, and knowledge and character.

And when somewhere along that road he stands before her in the likeness in which she has molded him, her task is not yet done. As he grows, there comes a day when she is confronted with the hardest effort of all. She must relinquish him—in part at least. She must let him learn to stand alone.

This precious baby of hers demands the right to realize his own individuality. The child, whether son or daughter, must be allowed, in spite of the mother's anxious hovering, to take the risk of cruel shocks and bruises which attend inexperience. Only thus can the capacity for self-direction be developed.

The Salvation Army, most practical of soul-savers, holds that new clothes may be a means of grace. They advise that every woman inmate of a reformatory should, on being released, be presented with a new hat as an aid to leading a better life. They stress the fact that the hat must be one never worn before, not an old one freshened up with new trimmings, and of course the hats must not be alike but each one individual to its owner. That seems sound psychology.

GRANDPA'S LOVE

They said he sent his love to me.
They didn't put it in my hand,
And when I asked them where it was
They said I couldn't understand.

I couldn't find it anywhere,
I hunted for it all the day,
And when I said it wasn't there,
They smiled and turned their heads away.

They said that love was something kind,
That I could neither feel nor touch;
I wish he'd sent me something else,
I like his cough drops twice as much.
—Author unknown.

Age of Spontaneous Art

IT HAS long been observed that children "go through" certain phases at certain stages of their development. There's the age of destruction, and very little later the age of construction. Almost all small girls "mother" something.

Among American boys, there is, practically always, the Indian age, when they love to dress up in feathered headgear and creep up on imaginary enemies. A large percentage show an inclination to revert to primitive modes of life.

Almost every child goes through the rhyming age. The smallest children take extreme delight in jingles even before the sense means anything to them. Later on they make rhymes themselves, at first with little regard to meaning.

We have not been so quick to recognize the artistic age. Nearly every child of school age now draws and colors. This has drawn attention to the really remarkable things done by many children. A short time ago I read of the talent shown by some school exhibits, and the interesting native differences of expression between, for instance, the pictures designed by little Mexicans and those by American children.

The work of the Mexican school children was surprisingly excellent but purely objective as distinguished from the more imaginative work of our own youngsters. It was "saturated with color," vivid, full of life depicted as it presents itself to the eyes of a child. Our pupils chose more romantic subjects and some very imaginative interpretations such as "Sound of a Brass Band" and "When You Are Dizzy." Many expressed themselves admirably in modeling clay.

In most public schools, the art education stops when the children reach their teens. We are told that even children who seek this form of expression in early youth, drop out of it as naturally as boys drop out of the Indian phase. If the study is kept up, many lose their naivete and simplicity of expression, become self-conscious and therefore trite, dull and uninteresting.

A certain percentage, however, make in school days the beginning of a future career, and all, it would seem, must lay the foundation for a most desirable appreciation of and interest in the art of others more decidedly gifted than themselves.

The Best of Friends

WHAT kind of friends have you? Isn't it delightful to be with people who tactfully imply that we are cleverer or better or more beautiful than we, in our sober moments, ever dared to think? Subtle flattery pleases even the fastidious, and many of us can unflinchingly swallow it in large unbroken doses.

One trouble about lending our ears complacently to too many compliments is that we begin to suspect they may be true. The delicate sauce that at first tickled our budding appetite for flattery, seems to grow flavorless, and we demand a more and more highly seasoned diet until we are likely to become fairly eaten up with self-conceit.

Still, we do not live very long before finding out that it is by no means always those who are loudest in their protestations of admiration who are willing to be of any real service. All their pretty sayings have come easily. Soft talk costs nothing. But are they ready to stick by us in trouble? Will they for our sake, exert or inconvenience themselves?

These are tests of a true friend. Even the truest may often tell us suspiciously lovely things about ourselves. This is because, regarding us with the eyes of love, they unconsciously exaggerate every one of our gifts and qualities. They are "to our faults a little blind, and to our virtues very kind." But this, being entirely sincere, can scarcely be

called flattery. People with a spark of nobility of nature are spurred on by the excessive esteem of those they love and make a greater effort to become more worthy.

I like the definition of a true friend as "One who sees something in us and tries to get it out." Such friends are going to exhaust every method until they either succeed or give up. Alas for us if, by falling into the very human "attitude of defense instead of inquiry under criticism," we lose both our friend and our opportunity for improvement.

So much has been said, felt and written about the great, the inestimable worth of true friends, that it is strange we should sometimes pettishly, or merely heedlessly, allow them to drift away from us. We need these friends, some day we may need them

sorely. And though we may think that one true friend is sufficient to fill our hearts, we are not wise in this. There will ever be one dearest of all, but seldom can two human beings furnish each other the fullest measure of understanding on every point of contact.

This friend is sympathetic to one side of our nature, that friend may be more keenly appreciative of another phase of our individuality. Moreover, when we consider the unpredictable course of events, we realize the awful desolation of loneliness that must fall upon those who lose their sole and only friend. Love is the one thing of which it can be truly said that the more we give the more we have. The greatest joy in life is to give and receive love and friendship freely and generously.

Fakirs and the Mind

YOU'RE not superstitious are you? Of course not. You're too intelligent. I'm not superstitious myself. I don't hesitate to sit 13 at a table or begin anything from taking a journey to making a dress on Friday. Experience teaches me that up to date I've always accomplished the first and rarely the second. However, since sewing begun on Mondays, Wednesdays or Saturdays meets the same fate, that's immaterial.

And yet—and yet! Sometimes when I lie uneasily awake at night after such a good supper, including mince pie, I hear a faint tick-tick-tick. What can it be? It seems to come from the wall. Do you suppose it could perhaps be the "death-watch"? Does it foretell the approaching end of someone I love—or of my precious self?

If my most intelligent paternal Aunt dreams of water, she urges us for weeks thereafter to be extra careful of ourselves. She's of Scotch descent and has an inherited claim to second sight. One member of the clan in every generation has it.

Are you entirely comfortable if a bird flies into the room or a mirror shatters? Look far enough and you'll find something that gives you causeless creeps. We've not outgrown our nonsense by any means. Even fortune tellers affect some of us deplorably.

I can think right now of two women I know who had "no faith whatever in them, my dear." Yet the life of one was almost ruined and that of the other bids fair to be shortened by the prophecies made to them.

The young business girl was told she'd soon lose a very dear friend, go through a period of great misfortune and eventually marry a millionaire. Not very long passes by any of us without the death of some acquaintance. Soon the girl's employer died. Not so very dear before his death but dear enough to serve as confirmation of the prediction.

Unconsciously she set herself to make it come true. She brooded, grew careless in dress and work, lost a good position and fell into severe straits. The last I heard, she was greatly improved in health and spirits. I hope the faith that almost ruined her life may help her to achieve the foretold marriage with a millionaire.

The second victim of ill omen went "merely out of curiosity" to the late well-known Cheiro. The seer cruelly told about how many years her husband, brother and herself had to live. He prudently allowed the latitude of a year or so either way.

Husband and brother, both considerably older than herself, passed away approximately within the given period. In years, her own time limit approached. She was in good health and "didn't attach any importance to it"; wouldn't have given it another thought but for her husband and brother.

It was pointed out that anyone, simply by consulting insurance tables, could with reasonable hope of fulfill-

ment predict their own or another's remaining span of life. Like all who are "convinced against their will," she holds "the same opinion still." It's telling on her health. If she makes up her mind she's going to die within two years, die she will.

It's inadvisable to consult fortune tellers "just for fun." They'll likely surprise you by telling you something about yourself which, without knowing it, you yourself have informed them of. They're splendid guessers and may puzzle you a lot. There must be something in it, you think. From then on you're lost to reason.

Avoid Spring Fever

THIS is the season of the year when housekeepers should be most diligent in seeking to provide a properly balanced ration. It is never difficult in cities to obtain fresh fruits and vegetables if you are willing to pay the freight. Delicacies from warm climates must travel expensively if dwellers in cold climates are to enjoy them.

In our rural communities, however, it is not only expensive but sometimes impossible to get what is desirable in the way of fresh vegetable food. The housewife who has neglected to can such things as tomatoes and beans, who does not have apples on hand at least until the earliest greens crop up, who never serves an orange for the sake of its tonic juices and who does not make liberal use of leafy cabbages and whatever vegetables will stand by us through our cold winters, is laying up trouble for her household.

Spring fever, or a severe bilious attack during the first warm days, was once thought unavoidable, like many so-called "visitations of Providence" which have since been proved to follow flagrant neglect of the laws of sanitation and hygiene.

It's not particularly hard to please the appetites of the ordinary family in cold weather. Cold sets a keener edge on hunger, and the craving for heat-producing foods inclines all to a heartier consumption of sweets, fats, etc. But because people are satisfied is no proof that they are getting all that is good for them.

Spring is on the way. If you have for the past few months neglected to provide the most healthfully varied diet, make an effort to remedy the defect at once. Set upon your table such things as shall best prepare the system to resist the strain incident upon adjustment to suddenly warmer temperatures.

To Study Our Schools

A PARTY of 25 German educators is scheduled to arrive in the United States this March and to spend more than three months in studying our institutions of learning of every type. They will travel many thousands of miles, north, south and west. It is at such times that we feel a particular satisfaction in what we have done to make us proud of our schools.

If perchance, as does happen in

some localities, the schools are nothing to be proud of, this foreign eagerness to profit by what we have to show them, may stir up greater efforts to make the schools more worthy. Nothing like anticipated callers to set everyone putting the house to rights.

Next year, some of our own outstanding educators will return the compliment and make a similar tour of inspection and study in Germany. This interchange of viewpoint should be vastly profitable to both sides. It will, doubtless show, not only many things to be imitated, but also some to be avoided.

If the educators will but set out in the proper scientific spirit of humility and open-mindedness, a great deal may be learned to the mutual advantage of the two nations.

AH HA! we've thought so all along. Lectures from fathers have been very much in vogue time out of mind. They have always been popular—particularly with fathers.

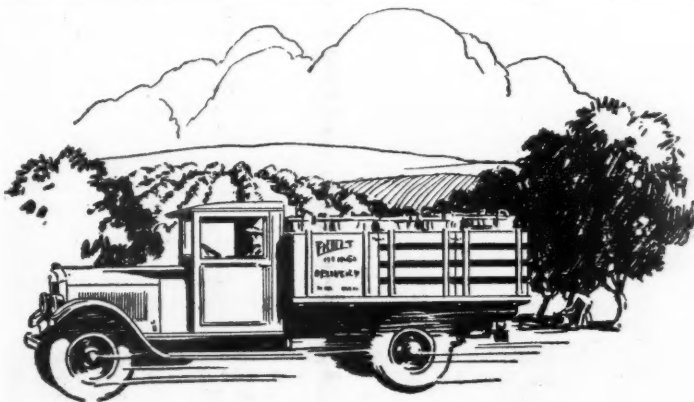
Now we see the first official recognition, so to speak, that the course has

begun to pall. Lectures for fathers are being introduced. We wonder if fathers will adopt the change enthusiastically. Dr. Camgee, an English physician associated with the child welfare committee, asserts that fathers must learn how to care for their children.

He says that babies are left too much to the sole care of their mothers. In response to his call, the Hull city corporation has instituted a course of lectures for fathers on the care of babies.

It is to be hoped that the classes may be well attended. Somehow we doubt that they will be unless, indeed, it be made compulsory. It wouldn't do a bit of harm to a lot of mothers we know if they should "listen in" when free information is being passed out.

The death rate for infants under one year of age during 1926 was 72.8 per 1000 births. In 1925 the death rate was 71.5 per 1000 births. These figures are based on mortality records from 28 states.



Protect Your Perishable Products

You can keep your fruits or vegetables in better condition if you haul them in Speed Wagons.

For Speed Wagons cushion their loads with long flexible springs and pneumatic tires. The smooth, steady power of their husky 6-cylinder engines cuts down vibration, while perfect chassis balance and dependable braking minimize danger on the road.

There is less chance of spoilage enroute, because Speed Wagons are faster and more dependable.

Try out a new Speed Wagon today—start it, step on it, stop it.

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The JUNIOR

For loads up to one-half ton

6 Cylinders
4-Wheel Brakes
Coupe Comfort

The TONNER

For hauling one-ton loads

6 Cylinders
4-Wheel Brakes
Coupe Cab

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For the world's average load—up to a ton and a half

6 Cylinders
4-Wheel Brakes
Coupe Cab

The MASTER

A little huskier than the Standard— for hauling loads up to two tons

6 Cylinders
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Why the Peach Sometimes Fails to Set Fruit

By M. A. BLAKE

New Jersey Agricultural Experiment Station

PEACH GROWERS understand the failures of a peach crop when the fruit buds are killed by low winter temperatures or by frost when the trees are in bloom in early spring. But there is another cause of failure of fruit to set and mature that is not generally recognized.

It was reported that a considerable percentage of peach buds had reached the so-called advanced pink stage in some parts of Georgia last spring when a cold period occurred. Some of the more advanced buds which had actually opened were injured by the cold, but growers fully expected that the balance would set fruit. No injury, as a result of the cold, was apparent. The buds finally opened, bloomed and set small green fruits. Many growers were quite hopeful and estimated that they would have a considerable crop, but suddenly a large percentage of the little green fruits dropped, or in other words, melted away almost over night. The puzzle was: What caused the failure to set? The general opinion seemed to be that there was no actual injury of these buds by cold. Some attributed the failure to lack of pollination.

A Little Known Fact

Extensive investigations with peaches have been conducted by the New Jersey Experiment Station at New Brunswick, N. J., since 1905. During the period from 1914 to 1927 inclusive, special observations have been made upon the development of the flowers and fruit set upon the peach. In connection with these studies, a most important fact has been noted.

If the peach bud reaches an advanced pink stage, or, in other words, is almost ready to bloom and then is apparently held at this stage of development for a number of days as a result of low temperatures, the flowers may later open normally, the small, green fruits will form, but after a time a large percentage of them will drop off.

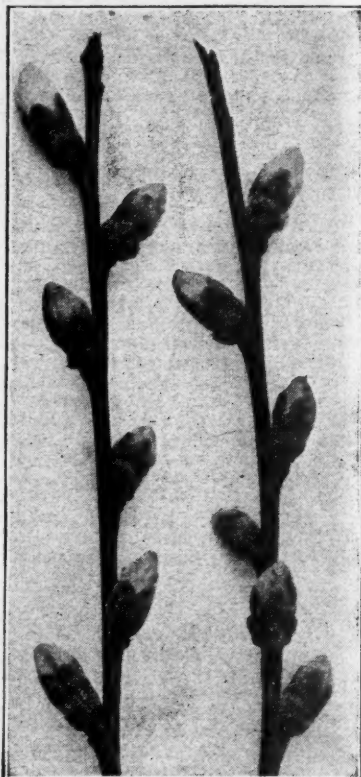
It was found, as a result of special observations in the spring of 1927, that peach buds in the advanced pink stage could be held in this apparent outward condition at a constant temperature of about 45 degrees Fahrenheit. In other words, flowers just ready to expand their petals could be prevented from doing so if the temperature was held down to about 45 degrees Fahrenheit.

Development Proceeds

While temperatures as high as 45 degrees Fahrenheit did prevent the opening of the petals, they were not low enough to prevent development of the pistil, or interior organs of the flower. In fact, distinct growth and development could be detected in those parts down to temperatures as low as about 40 to 41 degrees Fahrenheit. In other words, although outward appearances indicated that development of the flowers had been arrested, it was actually taking place. If the development of the interior organs is continued to a certain point, while the petals remain closed as a result of low temperatures, a large proportion of the flowers will fail to result in matured fruits. Undoubtedly a condition of this kind occurred in Georgia, where the flowers were apparently not injured by the cold, but where the green fruits dropped heavily later.

It has also been observed that if peach trees are grown in pots in the greenhouse and maintained at temperatures well above freezing during the winter, they will not bloom as early in the spring as peach trees wintered out-of-doors. In fact, a large percentage of the bloom will usually fail to mature fruit.

Peach growers in southern California complain that peaches are delayed in bloom if the weather remains too warm during the so-called dor-



Peach buds held in the advance pink bud stage for any length of time usually fail to set and to hold the fruit

mant or rest season, and that when the bloom is delayed in this manner the flowers fail to set fruit.

These facts as to the behavior of the peach explain why the trees fail to hold a set of fruit under certain conditions.

Nitrogen Fertilizers Do Not Affect Keeping Quality of Plums

EXPERIMENTS recently completed in Placer county, California, show that fertilizers do not affect the keeping quality of plums, according to Farm Adviser R. D. McCallum of Placer county and F. W. Allen of the University of California. The results seem to dispose of the fear held by some growers that nitrogenous fertilizers may cause the fruit to break down rapidly after reaching maturity.

Two plots of Santa Rosa plums were fertilized. One received sulphate of ammonia and the other a complete fertilizer. Fruit from the two plots and from a check plot was harvested at the same time. The fruit was shipped to Davis and kept in cold storage there for 10 days, which is the approximate time required to reach eastern markets. When the fruit was removed and exposed to room temperatures, no difference in keeping quality was observed. The fruit from all plots appeared to break down at practically the same time.

Embarrassing Virtue

"I'm something of a mind reader. I can tell at a glance just what a person is thinking of me."
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ails

The European Red Mite Travels Westward

(Continued from page 4)

up in number to the point at which mated 15 cents a pound as the cost "on the tree" to produce salable fruit. they become a menace to their host, and by this time, July or August, a great part of the damage to the foliage has been done. Heavy rains also reduce red mite damage by washing the mites from the leaves before they have done much feeding and before many eggs have been laid.

There is too much at stake to depend upon the weather or upon natural enemies to control European red mite, so the grower must make provision in his spray schedule for its control. Fortunately, this can be done without additional applications and without increased expense.

Several experiment stations have been working on the control of the European red mite and report that a miscible oil, applied each year as a delayed dormant spray, gives practically a perfect control. This spray kills 97 to 99 per cent of the overwintering eggs and insures complete protection against any loss from mite injury during the entire season. Sprays applied in fall or mid-winter lose much of their effectiveness, since the mite eggs become much more susceptible and are more easily killed as their hatching time approaches. The spray should be applied from the ground and directed upward, as the eggs, for the most part, are laid on the under side of the twigs. It may be mentioned here as a curious fact that dry lime-sulphur at the dormant strength killed over 52 per cent of the eggs, as against a 44 per cent kill secured by the standard liquid lime-sulphur. After the eggs have hatched it is difficult to hold the mite in check. Summer applications of lime sulphur or sulphur dust undoubtedly kill many mites, but there are so many summer eggs present which are not killed by these materials that it is but a few days before the leaves are again infested.

Other Orchard Pests Controlled

Spring application of miscible oils control not only European red mite, but also have proved to be exceptionally effective in controlling San Jose scale, leaf roller, aphid and pear psylla. For the control of aphids, however, it is essential that the application be made after the buds have burst and the green tips of the leaves are showing. While most miscible oils and some oil emulsions are safe to use as a dormant spray, and have not caused any injury to the trees with repeated annual applications, care must be used in applying oils, especially the lighter oils and oil emulsions, after the leaves begin to show.

No "Cumulative Injury" from Oil

There is no foundation for the belief among some growers that a good petroleum spray may not be used annually. Many of the fruit trees on the Pacific Coast receive a heavy annual dormant oil spray to control the fruit tree leaf roller. No oil injury has ever been noticed in that region except when broken down emulsions were used.

Dr. B. A. Porter, federal entomologist, stationed at Vincennes, Ind., who has specialized for some years on oil sprays, told the members of the New York State Horticultural Society at the Rochester meeting in 1927:

"Nor has there been so far any evidence of cumulative injury. Most of the orchards in Arkansas have received five annual applications of oil, and many apple and peach orchards of southern Indiana, Illinois and Georgia have received four successive annual applications. As yet no indication of cumulative injury is apparent. * * * Ackerman (a federal entomologist in Arkansas) sprayed young apple trees for two successive seasons with emulsion at 50 per cent of oil, and I have done the same thing with 20 per cent of oil. In both cases no sign of injury developed beyond a slight retardation of the buds."

No Washing Machinery Here

By WILLIAM L. TEUTSCH

Oregon Agricultural College

APPLE GROWERS in many sections of the United States have been forced to install wiping or washing machinery to reduce the residue from arsenical sprays used in the control of codling moth. This is not the case, however, in Union county, Oregon, where no difficulty is experienced with the arsenical residue. This Blue Mountain section has been considered by some to be a marginal apple producing area. Only two dustings are given to adequately control codling moth, and the arsenical residue is practically nil. Apple samples taken from 14 orchards of the district were recently tested by government chemists, and all of them showed only a trace of residue falling far below the government tolerance.

H. H. Weatherspoon, one of the veteran growers of the district, a member of the Oregon State Board of Horticulture for 14 years, considers this fact a great advantage in the apple production business, as it enables a lower cost of production. In this district only two applications of dust are applied, one at the customary time the calyx spray is given and the second consisting of a cover dust about two weeks later. Mr. Weatherspoon has found that under Union county conditions, a calcium arsenate dust mixed in proportion of 20 parts by volume of calcium arsenate to 80 parts of the chalk-like dust found in the district, gives good results in controlling codling moth. In the Weatherspoon packing plant it

was nearly impossible to find a wormy apple. Of 100 apples which had showed presence of worm, gathered by Mr. Weatherspoon and carefully examined, 92 of the worms were killed as they entered the apple, two were killed as they ate their way out, and six were found still alive.

Started 18 Years Ago

Mr. Weatherspoon, one of the veteran apple growers of the Northwest, planted his first orchard at Elgin, Ore., 18 years ago in one of the high altitude counties in the state and under conditions which nearly everyone predicted would result in failure.

Mr. Weatherspoon's modern packing plant with its grading machines is capable of packing out a carload of apples every three hours. It is one of the modern plants in Oregon. His 160-acre apple orchard, together with his packing plant and equipment, is conservatively valued at \$100,000. Starting with but \$1000 and accumulating an estate worth \$100,000 in the short period of 18 years is no mean accomplishment. This, too, was done under conditions of climate which these is the fact that codling moth most growers thought were hazardous to an apple production enterprise.

But Mr. Weatherspoon has found that under such conditions there were compensations, and not the least of can easily be controlled, thus making it unnecessary to incur additional expense in washing or in wiping to reduce the arsenical residue.

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1. Red mite eggs on apple twig (enlarged 5 times).
2. Adult Red Mite (enlarged 50 times).
3. Healthy apple leaf.
4. Apple leaf bronzed by Red Mite.
5. Peach leaf injured by Red Mite attack.
6. Healthy peach leaf.

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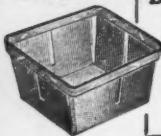
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Topworking Pecan Trees By Inserting Patch Buds In Large Limbs

By F. R. BRISON,

National Pecan Growers' Exchange.

THERE are two objections to the practice of topworking pecan trees by cutting them back in the dormant season and inserting buds the following July or August in the young shoots that have developed in the meantime. The first cutting back is a radical treatment and often the "stubs" that are left, as a result of not having the normal leaf surface to assimilate the raw sap that comes up from the root system, become diseased and are susceptible to attack by wood rot fungi. A second objection is that the tree receives another set-back when the native shoot on which the bud is placed is cut off beyond the bud in order to stimulate the growth of the inserted bud. The result is trees so treated too often do not make a characteristic normal growth for a year or two after having been topworked.

A system of topworking in which buds are inserted in the thick rough bark of the pecan trees is giving good results with native trees under Texas conditions. Though it perhaps should not be recommended for general use under conditions that prevail in the southeastern states, yet its merits justify at least an experimental trial. Trees to be topworked by the method indicated require no previous special treatment or preparation. The patch bud seems to be better adapted for use when this system is to be employed than any other; and they may be inserted in limbs or stock three inches or less in diameter. Vigorous, thrifty trees up to 15 inches in diameter can be successfully topworked. Trees of that size, for example, will require from 12 to 20 buds, depending on their shape and general conformation. A good time to insert the patch buds is just as soon as the bark will slip freely in the spring. The buds thus have a longer growing season than when put in later, and usually are just one season's growth ahead of buds that are inserted in current season shoots the following July or August. As the bark of limbs or stock one or more inches in diameter is much thicker than the bark of the "patch bud," it is important that it be trimmed down to a thickness that will correspond to the thickness of the patch bud bark; this is important, otherwise it is exceedingly difficult to tie the patch bud on in a way that insures the two cambium layers being in perfect contact. An experienced budder can select limbs and locate the buds so that the relative shape and symmetry of the original top will be maintained.

When inserting patch buds on large stock, too much importance cannot be attached to the use of only large, vigorous-looking plump buds of the previous season's growth. When buds are inserted only such portions of the native limb beyond the bud should be cut off as will result in eliminating approximately one-half of the limb's foliage. Two weeks later one-half of the remaining foliage may be removed. Removing the foliage by cutting back the limb gradually serves to stimulate the inserted bud into growth; yet, the treatment is not so radical as to seriously interfere with the normal activities of a tree. Ordinarily, shoots that develop from patch buds make a vigorous growth; and as they are able to assimilate increasing quantities of raw sap, the tree's native top should be reduced correspondingly.

Under no circumstances is it advisable to cut off all the foliage of the stock at one operation unless the stock is small. Some of the leaves of the original stock should remain until the shoot that comes from the inserted bud has developed sufficient

growth to assimilate the raw sap from the root system. If all the leaves are removed at one time, leaving a stub with no foliage to assimilate the sap, the stub is likely to become diseased and thereby rendered extremely susceptible to attacks of fungi, ants and other insects attracted by the souring sap. When the original stock is finally removed it should be cut back even with the budded shoot leaving no stub whatever projecting above to serve as a "blind alley" for sap. The sap in these stubs, finding no bud outlet, ferments and creates a condition favorable to wood rot and decay. Such decay once begun often extends far below a growing branch and the tree becomes weakened and often ruined. Too often tree pruners do not recognize this important fact, and we frequently see stubs projecting one to several inches above a growing limb.

National Pecan Exchange News.

The Grafting Candle

By ROY M. KOON

Massachusetts Agricultural College

IT IS a conceded fact among the horticulturists that the most difficult operation in outdoor grafting is the application of the wax. If the weather is cold, as it usually is when grafting can be done, it is next to impossible to work the wax. If a softer wax is used, it sticks to the hands rather than to the graft. Wax pots are extremely awkward to handle, particularly when topworking a large tree.

After experiencing these difficulties for several years, the writer set about to devise some means whereby the waxing process could be rendered less irksome and more successful. The result was the grafting candle, which is described as follows:

The core for the candle is made by repeatedly dipping six eight-inch strands of cotton wicking in melted paraffin. The paraffin is allowed to harden on the wicking after each dip. A core one-quarter inch in diameter is sufficient.

The wax for the shell is made by the usual 4-2-1 formula. Four pounds of powdered resin, two pounds of beeswax and one pound of tallow are melted in the order mentioned, the beeswax being added to the melted resin, the tallow added last. The hot mixture is poured slowly into cold water; then pulled until light in color. This wax is rolled thin by means of a rolling pin on which some tallow has been rubbed. The core is then rolled up in enough of this sheet to make a candle one and one-half inches in diameter. It may occur to the reader that the shell might be put on by dipping the paraffin core into melted grafting wax instead of rolling. This was tried, but as the melting point of grafting wax is greater than that of paraffin, the latter melted off the wicking at once.

To use the candle, simply light the wick, hold over the graft in a horizontal position and let the warm wax drip upon the incision. It will not be hot enough to injure the tissue. The candle is not extinguished by an ordinary breeze; the hands of the operator are kept free of wax; and a perfect seal is obtained, thus insuring a higher percentage of success than by the old method.

He-If you keep looking at me like that I'm going to kiss you.

She-Well, I can't hold this expression very much longer.—Answers, London.

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The Sweet Cherry a Dependable Commercial Fruit

(Continued from page 6)

Contrasting with this, Schmidts and Windsors are being produced for about three cents a pound. Taking all in all, Schmidt's Biggereau is the most satisfactory variety to plant, at least for Michigan, but a sufficient amount of Windsors or Bings must be interplanted to insure proper pollination, about three rows of Schmidts to one row of another variety.

Planting

While there are many people who recommend that sweet cherries be planted 30 feet or more apart, it is the writer's opinion that quality will not be sacrificed for a long time if the trees are planted diagonally about 20 feet apart. Later, if necessary, every other row might be removed, leaving them on the square about two rods apart. This insures better production during the first 20 years of their growth. The sweet cherry is naturally a larger and longer lived tree than the sour. The fruit of the sweet cherry must be large to sell well, even at the expense of the amount produced. The sour cherry need not be extremely large, quantity of production being the outstanding factor in its culture.

The writer believes a number one two-year-old tree is the best to plant. It is very important to plant as early in the spring as possible, before the buds have had a chance to swell. In many cases, it is wise to obtain the trees in the fall, heading them in in a protected place during the winter. They will then be available for early spring planting.

Pruning

During the first two years, the modified leader type of tree should be established. This consists of a head in the usual place, two to three feet above the ground, made up of four or five branches. From a central leader, a similar head can be started the second year, a couple of feet above this. As sweet cherry branches are liable to split down at the crotches, it is important to select those branches naturally growing out at an obtuse angle. If the lower head branches are too close together, they may shut off the sap flow to the leader and therefore spoil the chance for a head above. After this type of heading has been established, little or no pruning is desirable until the tree reaches the age of about 12 years, when it should be in good bearing. Ordinarily, even at this stage, the pruning should consist largely of removing a few weaker branches in the more crowded parts.

At this point, however, comes in a consideration of quality and not quantity production. The market pays a handsome reward for "the big ones." Consequently, if cultivation and fertilization are not sufficient to make large, uniform fruit, a general thinning out and cutting back of branches, besides heading back the top, will be necessary. In other words, here is the only practical way to thin the fruit. It is done so, nevertheless, at the expense of yield. If cultivation and fertilization are not sufficient to keep the tree in a vigorous, healthy condition, we again look to pruning to help bring about that condition. On the whole, if the tree is vigorous and is bearing fine, large fruit, little or no pruning should be practiced.

Cultivation and Fertilization

As early as possible in the spring, the ground should be gone over thoroughly with the disk several times. This covers up diseased leaves and trash of the preceding year. From this time until the forepart of July, our orchard is cultivated with a Forker harrow about once a week or every 10 days. Our aim is to carry on the work so intensively as to allow nothing to grow on the ground while the fruit is developing. After this a cover crop, which will winter kill, is

allowed to grow. Sometimes a natural stand of weeds, such as pig weed or red root, serves the purpose equally well and is cheaper than oats, for example.

Sweet cherries demand a very fertile soil, preferably a soil with sand in it. It is desirable to produce a good vigorous growth but it must be well matured when winter sets in. Too rank a growth is apt to be seriously winter injured. This may kill the tree at once or injure the wood in such a way that it will never do as well afterwards. Usually the cover crop will prevent this trouble. Immature wood, however, may result from applying the fertilizer too late, or it may result from premature defoliation of the leaves caused by spray injury, shot hole fungus, etc.

Keeping the size of the fruit and the vigor of the tree always in mind, an equally, if not more important factor than pruning or cultivation, is fertilization. Some soils may be fertile enough to maintain a good, vigorous tree in bearing for some years. There will come a time probably when even these soils will respond greatly to the use of fertilizers. In Michigan, the only fertilizer of demonstrated value for sweet cherries is nitrogenous in character. A quick acting fertilizer, such as ammonium sulphate or sodium nitrate, applied just as the buds are starting to swell in the spring, gives best results. We apply one-third to one-half pound to one and two-year-old trees. From then on the amount is gradually increased, varying with the age, size and vigor of the tree. A large and heavily producing tree receives about nine pounds.

Spraying

Space does not permit a detailed consideration of the various pests and diseases of the sweet cherry, but suffice it to say that the spraying schedules given out by the agricultural colleges should be followed closely. Lime-sulphur solution should not be stronger than one to 50. Even at this dilute strength, great care must be used in applying it where a spray gun is used to prevent foliage injury. A coarse spray directed under full pressure to nearby foliage may cause much burning. On young vigorous growth, it is often very difficult and expensive to control the black cherry aphid. When not many are present, it often pays best to go over the trees, cutting off the infested ends and burning them. Where there is a general infestation, however, nicotine sulphate should be used. While usually it is recommended to add this to the lime-sulphur spray, we find a separate nicotine sulphate and soap spray is more uniformly effective.

One other trouble should be mentioned. This is "collar rot," which attacks both sweet and sour cherries. The first signs of the trouble appear early in the season. The leaves are a lighter green, almost olive in color, and are slightly curled. The growth practically ceases, in spite of the fact that the tree may have appeared very vigorous the preceding year. This condition may terminate the present season in the death of the tree, or it may linger along for several years. The actual trouble is just beneath the surface of the ground, where a gradual rotting of the collar takes place. This trouble seems to occur more generally in trees that are perhaps too vigorous. New land with much organic material in it may also be a contributing factor. Freezing and thawing in late fall and early winter probably causes the initial injury. This trouble may often be stopped by digging the ground away from the trunk so as to expose the affected part to the air. If the trunk is not already girdled, the affected parts can be cut away and the wounds disinfected. This is a serious trouble, often causing a high mortality in a young orchard.

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Provide Good Books for the Children

THE lives of great and successful men, almost without exception, offer positive proof that the type of reading matter indulged in is a powerful factor in success. Books have the power to mold men into fine, strong, ambitious citizens, or into pitiable weaklings and degenerates.

Can we then, as mothers and fathers, afford not to provide our sons and daughters with enjoyable, yet inspiring and character-building books and magazines? I think not.

The first milestone on the road to Good Books is teaching the child to read easily and well, and instilling in him a love of reading. Begin with simple children's stories long before the boy or girl is of school age and, working with him, teach him to read. It will be a game then, and he will take great pride in his progress. It will provide him with a means of amusing himself.

Read Out Loud Together.

The love of reading comes easily in a family of Book Lovers, especially one in which the reading-out-loud-together habit is firmly ingrained. This desire to read is partly inherited, but even the child who cares less for it, will fall in line after awhile. The home should always contain plenty of books and magazines designed to interest the various ages and types in the family.

Teaching selection is the next big problem for the parents who are trying to guide the child's tastes in the right direction. It is not to be expected that a child will read and love only those books which add to his knowledge or tend to better his morals, for there is a place for mental "play" as well as physical recreation. With proper management there is no excuse for the child even knowing of the existence of dime novels and their like, until he is old enough to have no desire to read them.

Need Good Magazines.

No home is a home without some good family magazines, of which there are many types. As soon as the children develop special tastes these can be fostered by providing magazines along that line. For instance there are wonderfully illustrated nature magazines, and just as interesting scientific magazines which make big hits with the boys. There are magazines with nice, clean, enjoyable stories, fashions, and practical articles. Then there are magazines that make a specialty of telling about interesting Americans who are successful. These will be found especially helpful and ambition-inspiring.

The writer cannot furnish names through these columns, but should any mother desire further information and the names of good magazines, we will be glad to give them on receipt of a stamped, self-addressed envelope with the request.

But to return to books. Little children enjoy "Mother Goose" rhymes and fairy tales, and these are valuable in developing the imagination of the little child. Fiction has a place, too, in the child's reading. Good impressions can be made, feelings swayed and sympathies developed by means of a story that is fictitious without being false.

The parents can cultivate a taste in the child for books of history, biography or travel, by seizing opportunities to suggest them when they come in naturally from some experience or incident. For example, when the Fourth of July is at hand tell the child briefly about the American Revolution and give him a book about the "Boys of 'Seventy-Six." When his attention is called to a picture of the Tower of London he is in a good mood to read some impressive story of English history. When he is at the beach, or in the mountains or on a picnic he can be shown some object of nature—a shell, a rock, or a tree, as a means of interesting him in a

little book about some phase of natural history or woodcraft. In this way he will soon find more real pleasure in these books than in light fiction.

A Suggestive List of Books.

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Picture books, "A B C" books, and special children's stories.

From Six to Ten Years

"Nursery Tales from Many Lands," by E. Skinner; "East o' the Sun and West o' the Moon," by Gudrin Thomson; "Seven Peas in the Pod," by Margery Bailey; "Arabian Nights," "Wonder Tales of the World," by Constance Armfield; "The Adventures of Odysseus and the Tale of Troy," by Padraic Colum; and "Stories of Other Lands."

From Twelve to Sixteen Years

"At the Back of the North Wind,"

Macdonald; "Gullivar's Travels Into Several Remote Regions of the World," by Jonathan Swift; "King Arthur" stories; "Merry Adventures of Robin Hood"; "Betty Wales," by Margaret Ward; "Patty" books by Jean Webster; "Little Women," by Louisa M. Alcott; "Little Men," by Louisa M. Alcott; "Scout Burton on the Range," by Edward G. Cheney; "Lost Dirigible," by Ralph Barbour; "Curly of the Circle Bar," by Joseph Ames; "Anne of Green Gables," by L. M. Montgomery; "Bob, Son of Battle," by Alfred Ollivant; "Stories of Luther Burbank and His Plant School," by Effie Y. Slusser; "Steam Shovel Men," by Ralph Payne; "Adrift on an Ice-pan," by Wilfred Grenfell; "Oregon Trail," by Francis Parkman; "Hans Brinker," by Mary Mapes Dodge; "Dog of Flanders," by Louis de la Rame; "Prince and the Pauper," by Samuel Clemens; "Two Little Confederates," by Thomas Nelson Page.

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Organdie Pillow No. 5321.—This pillow is of a beautiful shade of green with the flowers in two shades of rose, made to stand out from the pillow and give the effect of a real flower. The centers of the flowers are done in shades of light and dark yellow French knots. Two rows of a dainty ivory lace edging about one-half inch in width with a delicate thread of rose through it, are suggested for this pillow. The pillow measures 18 inches in diameter. A detailed working chart showing the exact color scheme, is furnished. The price of this pillow, postpaid to any address, is 65 cents.

Children's Aprons Nos. 4181 and 4182.—Here are two lovely designs in children's aprons in sizes four to six years. They are plain stamped on fast color cloth and will give excellent service, as the material will launder to very best advantage. Design 4181 comes in blue and Design 4182 in maize. Either of these aprons will be sent postpaid to any address on receipt of 45 cents.

Organdie Apron No. 5353.—This apron is made of yellow organdie with the flowers in shades of blue organdie

upon it. The petals of the flowers are of double thickness. An ivory lace edging one-half inch in width is suggested as an effective finish with ties of pale blue ribbon. A detailed working chart showing the exact color scheme to entirely finish the apron, is furnished. The price of this apron postpaid to any address is 65 cents.

Organdie Pillow No. 5323.—This pillow is of lavender organdie with the large flowers in shades of light and dark yellow and orange. The outer row of petals is of light yellow, the second row of a darker shade of yellow, and the inner row of a soft shade of orange organdie, all blending together in a most effective way. The petals are all finished with a picot edge so that they stand out from the pillow. The center of the flower is done in shades of light and dark yellow and light brown French knots. The leaves are in green. We suggest two rows of lace edging to finish this pillow effectively. A detailed working chart showing the exact color scheme and how to completely finish the pillow is furnished. The price of this pillow is \$1.30 postpaid to any address.

Embroidery Department, American Fruit Grower Magazine,
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Spraying the Orchard from the Stationary Plant

(Continued from page 10)

ard pipe. Heavy duty fittings and valves give greater satisfaction with high pressure in the lines.

How Pipe Lines Are Installed

Pipe lines are placed on the ground, underground and overhead. Most plants now installed are piped underground, but each method has its advantages and disadvantages. The surface method is sometimes considered temporary but may be retained in sod orchards or on hillsides where cultivation occurs in only one direction. In these cases the pipes are laid close to a row of trees and in a direction which will not interfere with one-way cultivation.

Care is necessary in laying pipe underground so that the entire line may be drained. Pipe thus laid is out of the way from all surface operations, since it is usually laid 14 to 18 inches deep. Leaks are harder to find, however, and repairs are more difficult.

Overhead pipes are supported by props and large limbs of trees. Short wires surround the pipe and are fastened to screw eyes in the limbs. This flexible attachment prevents loosening of pipe joints and damage to limbs.

Laterals are usually placed every six or eight rows, and a service connection or faucet for hose attachment is found at every fifth tree.

Hose Specifications

Hose lengths rarely exceed 100 feet, and the usual inside diameters are seven-sixteenths or one-half inch. The heaviest grades of rubber are not necessarily durable. The best grades of rubber and fabric are sometimes found in comparatively light hose, but this quality is expensive. When there are many days of spraying during the season, good hose is the cheapest, and light hose means all day efficiency in the crew.

Pressures

Pressure regulators similar in action to those found on portable sprayers are a part of the stationary installation. Pressure gauges of the ordinary commercial type may read from 25 to more than 100 pounds too high. For accurate readings, calibration testing is desirable, or else more accurate gauges should be obtained.

Pressures at the nozzle have increased rapidly since the advent of the gun. Where 200 pounds seemed satisfactory with small nozzles, 300 to 450 pounds or more is the present range. The higher pressures are most often found on stationary plants. Pressures of 450 pounds or more may really be necessary at stationary pumps due to friction and elevation. But that amount at the nozzle is not required for thorough spraying. Unnecessary pressure increases wear and tear on equipment, requires more power and higher priced machinery.

In large orchards where a 40-gallon per minute pump is inadequate, extra units up to four in number are being installed. Although the investment cost is heavy, growers claim that operation costs are less than for portable sprayers. Repair parts must be on hand for each unit, but the enthusiast for this type of plant points out that spraying operations are not dependent on a single pump unit.

Space permits the consideration of only one stationary plant in detail. The one chosen illustrates many of the points discussed in these articles. It also happens to be the largest plant known to the writer. Construction of the system has required unusual resourcefulness on the part of the owners.

The Leatherman Plant

A. R. and E. A. Leatherman of Rada, W. Va., own 14,000 apple trees (over 400 acres). The orchard is located on two mountain slopes which face each other and are about 1500 feet long. The

elevation at the top of the slope is 305 feet. The length of the orchard is seven-eighths of a mile.

A short distance above the ravine, the lime-sulphur cooking plant may be seen in the picture on page 10. Solution is drawn by gravity from the cooker to storage or settling tanks in the shed having open sides. The building at the bottom of the slope houses the 80-gallon per minute pump and the tank. A measuring can above the tank catches the lime-sulphur drawn by gravity through a valve, and eliminates all handling of the liquid after it is cooked.

Nearby is a spring which flows by gravity into each of the two 400-gallon tanks, the flow being regulated by valves. The tank is in one unit, with a partition in the middle. The pump is in one unit and operates readily at 600 pounds pressure, its usual output being 45 gallons per minute. Its reserve capacity is ample for growth of trees or emergencies requiring extra spraying crews. The Fordson tractor formerly used has been replaced by a 10-20 McCormick-Deering, which furnishes more power.

Although 600 pounds pressure is maintained at the pump, the pressure in various parts of the orchard is considerably less; at the most remote points it may drop to 200 pounds. To reach the 305 feet of elevation, spray material passes through 2700 feet of pipe. The greatest distance to any faucet from the pump is 6300 feet.

All pipe is black standard weight soft steel. Mains up the hill are two inches and are equipped with heavy duty steam valves. Gate valves prove satisfactory on one and one-half inch mains, and globes are used on laterals. At the top of each slope, through the use of one and one-half by one and one-half by two-inch tees, spray mixture is distributed to the remote parts of the orchard through one and one-half inch pipe.

The hose used is three-eighths inch in diameter and 250 feet long. One man drags the hose for the nozzleman. Fifty-six trees are sprayed from each hydrant, four rows of seven trees each on either side of the lateral. The Leatherman spraying crew consists of 13 men. One man mixes spray material and takes care of the machinery. The 12 other men make up six spraying crews, one man in each crew carrying 250 feet of hose.

The cost of the pump was \$750. Including the new tractor, the total cost of the plant is around \$9000. Compare this with his costs for spraying by the portable method. It was necessary when using the portable outfit to keep roads through his orchard in condition for spray rigs. These roads cost him \$1 per rod. The orchard is set 33 feet by 33 feet and these roads were built between every six rows of trees. Trucks still bring fruit down these roads to the packing house, but the cost of road upkeep is much less.

To complete spraying with portable outfits in five or six days, it took six of the largest sprayers made, costing \$1000 each.

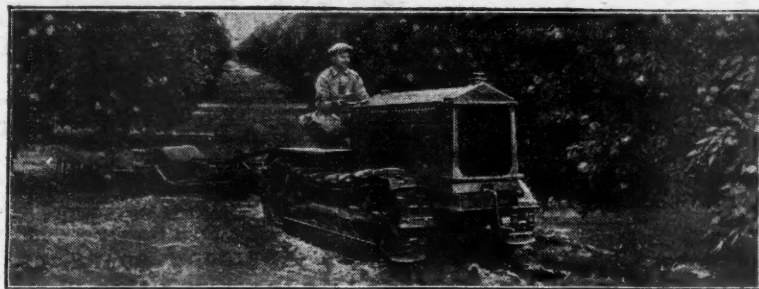
The items of cost follow:

6 spray outfits at \$1000.....	\$6000
6 tank wagons at \$400.....	2400
12 mules.....	3000
24 sets of harness.....	600

Total\$12,000

There were six extra men required on the tank wagons. Twenty-four mules had to be fed the year round. At the present time there are only two mules on the farm.

In Egypt, the strong, elastic mid-ribs of the great date leaves are made into containers and crates. In pruning, 12 to 20 lower leaves are removed each year. It is these leaves which are used for manufacturing the containers, which are used for many purposes.



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BEAN "Super Giant"

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BEAN "All Purpose"

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BEAN Power Duster

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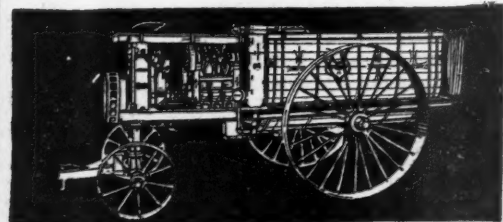


You get 25% greater capacity in the new Timken-equipped BEAN Super-Giant and BEAN Super-Giant Junior for 1928—25% greater efficiency—25% increased work from the pump at no increase in cost of operation. The Super-Giant now has a high-pressure capacity of 20 to 33 gals. a minute, according to size of pump and engine.

These new pumps are also equipped with Automatic Lubrication throughout, without sacrifice of the open accessible design which has always made the BEAN so easy to get at. Adjustments are a matter of minutes instead of hours on the simple accessible BEAN.

Growers who need big-capacity high-pressure equipment and who want very low-cost operation as well, should see these new Timken-equipped BEAN outfits at once.

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American Fruit Grower Magazine for March

EXPERIENCE can be a proficient teacher if some method is provided for recording our experiences. In the never-ending battle with insects and fungi, valuable lessons may be learned every season that will make each succeeding season's control work more effective. A note-book and pencil with a few minutes' time each day are but a slight investment. The returns on this expenditure will take the form of better and more easily marketable fruit. The day's weather, the temperature, the condition of the trees or plants as to stage of growth, the material and amount used, the pressure, etc., take but brief time to record. This may be supplemented, as the season advances, by brief memos of time of appearance of noticed insects and fungi—always with the mention of temperature and weather conditions. At the harvest, the percentages of blemished fruit should be listed. It would even pay to sort a quantity of blemished fruit, making note of the causes of the blemishes. This, if checked against the earlier records of spraying and dusting operations, will yield an appreciable amount of valuable information the first year, and each succeeding year.

Record Your Spraying Operations This Year

EVEN THE most hopeful proponent of a tariff on bananas can scarcely expect to secure more than a step-child's welcome from Congress for any suggestion looking toward tariff changes at this session. A general election approaches—a presidential election at that. During the session immediately preceding a presidential campaign, your congressman, if an aspirant for re-election, steppeth softly and considereth his way. He attends to routine with noticeable zeal. His services are freely at your disposal—to address a meeting, lay a cornerstone, or start an investigation. During the present session, your congressman may do many things—get married, go up in an airplane, join a church, or even in a moment of despondency he might commit suicide. But he will not willingly talk tariff increase, especially on some popular article of food. But much can be accomplished during the summer campaign. Write to your congressman, and to his opponent. Briefly explain how the free admission of bananas to this country affects the market for our native fruits, especially those you grow. After reviewing the situation as it affects you and other fruit growers in your district, ask each congressional aspirant in your district for an expression of opinion.

Campaign This Summer For a Tariff on Bananas

HARRY W. WALKER, EDITOR

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Fruit Farm Beekeeping

HAZEL BURSSELL
The Fruit Grower's Wife

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Pre-election statements are sometimes of doubtful value, but they will furnish something to work on when the next Congress assembles and the work of tariff revision gets under way.

TIME IS often the most important factor in securing the utmost results from spraying operations. And the most annoying—often the most costly—reason for loss of time, especially in the earlier, more vital sprays is the breakdown of spraying and dusting equipment at the beginning of the season's work.

Be Certain Your Sprayer Is Ready to Operate

Equipment should be thoroughly cleaned, oiled and stored for the winter, under cover, of course. But even at rest equipment will deteriorate. The grower who waits until time to use the sprayer before giving it a thorough test may be in for some vexatious and expensive delay. Better to run it out in the yard, fill it with water and start the engine. If, in spraying out this first tank, the outfit fails in any respect to work as it should, see that the adjustments or repairs are made at once. Trouble of any kind usually gets worse instead of better unless remedied when first noticed.

ONE OF the most important needs of the commercial fruit grower is a thorough knowledge of modern equipment designed for fruit farm use. Who will question that, at the state and regional horticultural meetings, the displays of fruit farm equipment are equal in educational value to the platform discussions? New machinery and new equipment are rarely, if ever, placed on the market until after rigid tests in actual practice. New materials for use of the growers undergo years of trial use before a manufacturer will venture to offer them for farm use. Records are made of the results of these tests and trials, which usually furnish valuable material for the commercial grower. In the business of fruit growing, every piece of new machinery or equipment that promises a saving of time and labor, and each new product that promises aid in growing or marketing better fruit, is worthy of investigation. In this issue, as in future issues of this magazine, will be found coupons for the readers' convenience in better informing himself of the merits of fruit farm equipment and supplies. Filling out and sending in these blanks will bring the most recent literature on valuable aids to fruit growing. It entails no obligation, except to read the literature you receive. Make use of this Service.

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